PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

Established 1886

Vigilance

Diligence, vigilance and enterprise are constantly necessary in a fast-moving world. They may be the enemies of repose, but they are powerful guarantors of success for the business that constantly employs them in the interests of its clients.

GOTTESMAN & COMPANY

—INCORPORATED—

WOOD PULP

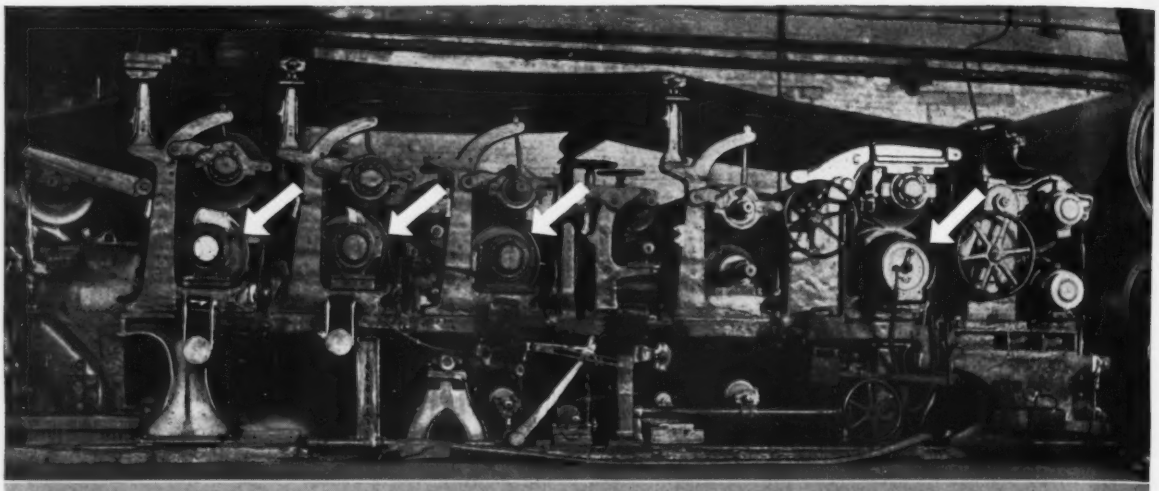
22 EAST 40th STREET NEW YORK, N. Y.

EUROPEAN OFFICES: Birger Jarlsgatan 8, Stockholm, Sweden

FEB. 17 1938

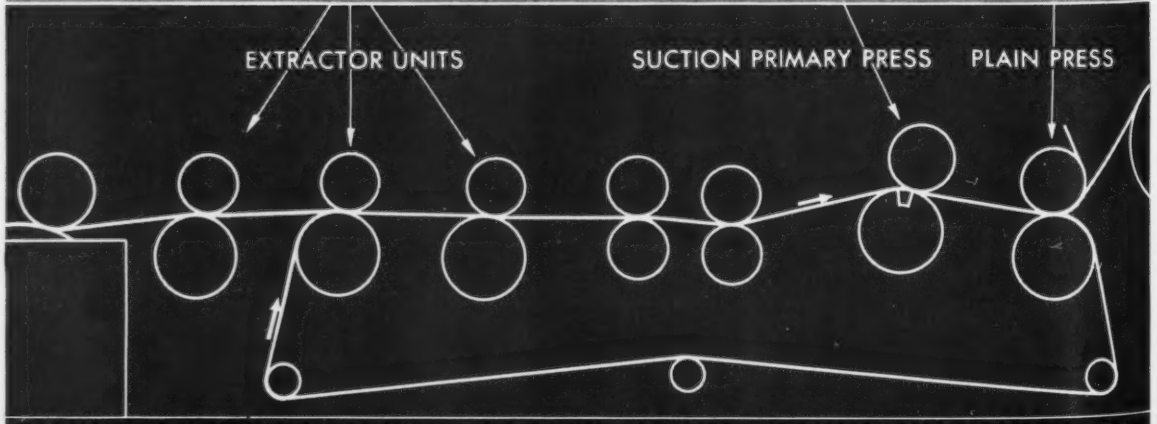
Vol. CVI No. 7

DOWNINGTOWN



DUO-DEHYDRATION
at Tennessee Paper Mills, Inc.

The results produced by one Extractor Unit, which was installed on this machine in August, 1928, influenced the Tennessee Paper Mills, Inc., Chattanooga, Tenn. to install another and later a third Extractor Unit. Next, they installed a Downingtown Suction Press making a modern Duo-Dehydration Press Part as pictured, which altogether gave them a much improved quality, in addition to a 10% increase in production . . . Approximately 150 Downingtown Extractors are now operating in various mills. If you would like to inspect some in your vicinity, write us.



DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.

Entered as second class matter at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial office: 15 W. 47th St., New York, N. Y. Domestic subscription U. S. and possessions, $4.00 per year.

PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

Published Every Thursday by the LOCKWOOD TRADE JOURNAL CO., Inc.

Executive and Editorial Offices: 15 West 47th Street, N. Y. C.
Western Rep.—H. K. Vinton, 123 W. Madison St., Chicago, Ill.

The Contents of this Publication are Copyrighted

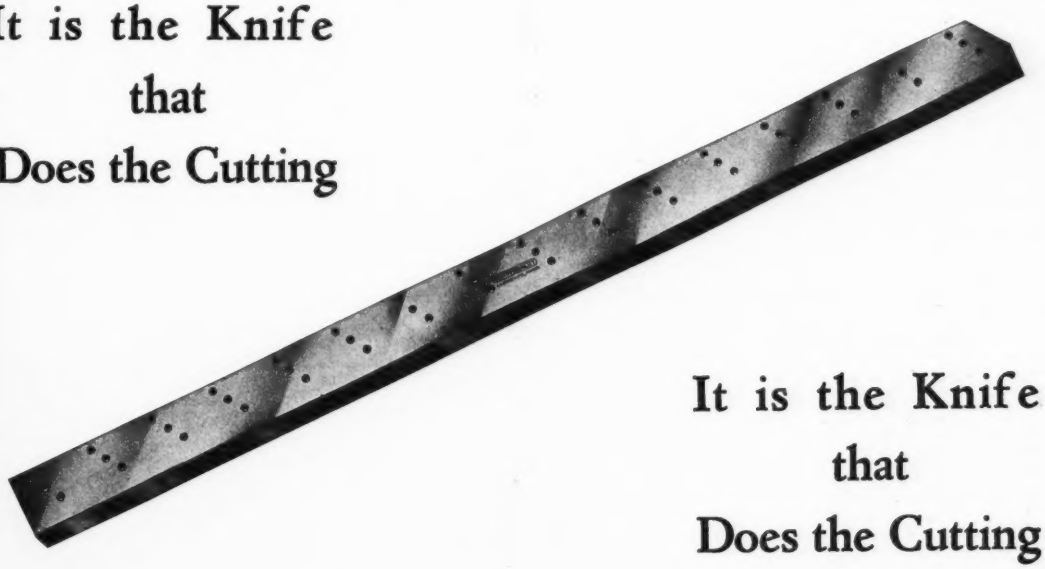
TABLE OF CONTENTS

New Giant Newsprint Mill in Production 11
Mead Corp. Buys Hager Strawboard Co. 11
Preparing Plans for Mill Improvements 11
Production of Consolidated Co. Stepped Up ... 12
Superintendents to Meet at Atlantic City 13
Osborn Paper Co. Signs Agreement 13
Sutherland Paper Buys Toledo Firm 13
Goes With Crocker-McElwain Paper Co. 13
J. M. Behnke Goes with Knowlton Bros. 13
Sulphite Paper Men to Hold Luncheon 13
Pick Up in Business Cheers Chicago Trade ... 14
P. T. A. Announces Convention Delegates 15
Financial News of Pulp and Paper Industry ... 16
Indianapolis Reports Improvement 17
Toronto Paper Box Men Meet 17
To Represent Mathias Paper Co. 17
Obituary 18
Construction News 20
A. H. Miller to Represent J. P. Lewis Co. ... 22
Rubber-Lined Chlorination Towers 22
To Manage Brown Towel Division 22
500 Tons of Wood Pulp Burn 22
Editorial 24
Government Paper Bids and Awards 25
Chlorine Institute Elects Officers 25
Production Ratio Report 25
Canada to Consider Log Export 25
Technical Section
Converting Starch for Tub Size 27
Driers in the Paper Industry 30
Review of the Paper Industry Literature ... 35
Delaware Valley TAPPI Discusses Printing 37
Lake States TAPPI Discusses Wood Measurement 38
Barnes Belts for the Paper Industry 38
Imports of Paper and Paper Stock 39
New York Market Review 42
Miscellaneous Markets 44
Market Quotations 46

The Paper Trade Journal is indexed in Industrial Arts Index

Copyright, 1938, by the Lockwood Trade Journal Co., Inc.

It is the Knife
that
Does the Cutting



It is the Knife
that
Does the Cutting

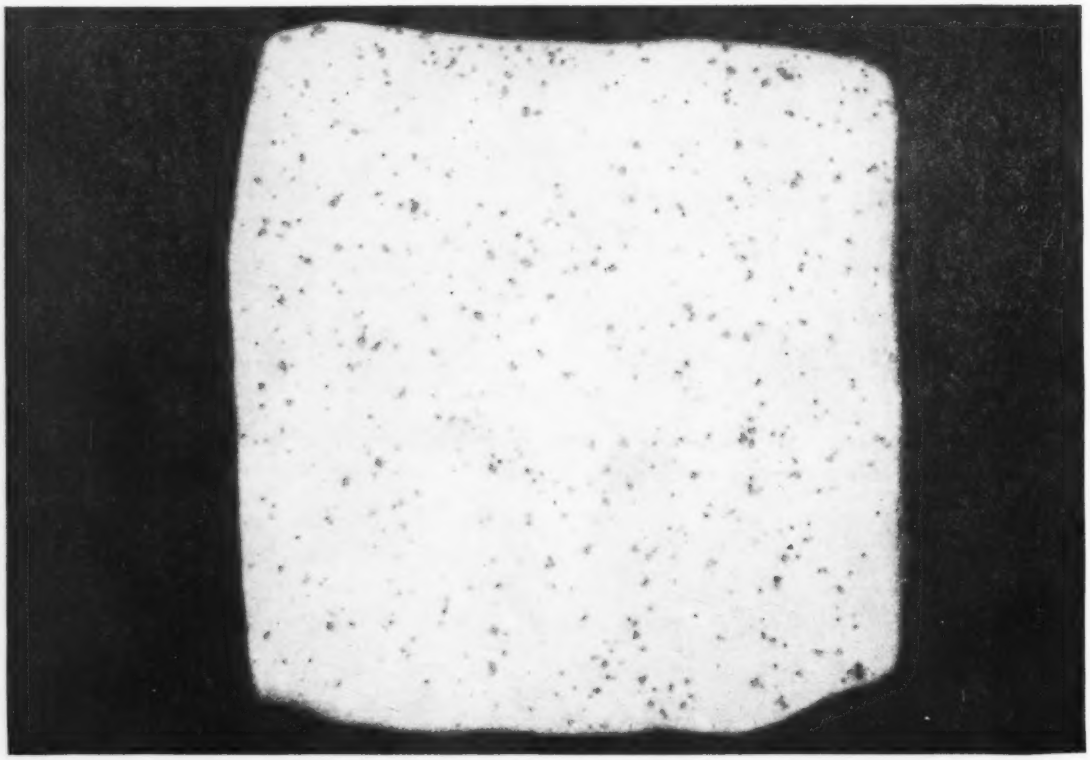
JOHN W. BOLTON & SONS, INC.

Lawrence, Mass.

RAYOX

PURE TITANIUM DIOXIDE

showing extremely fine particle size



This photograph shows one opening of a 325 mesh screen magnified 4,000 times. The opening is approximately 1/100,000th of a square inch. The dark spots are Rayox particles shown in comparison to the size of this extremely fine opening

R T VANDERBILT CO NY U.S.A. AMERICAN PRODUCTS
RAYOX

R. T. VANDERBILT CO., INC • 230 PARK AVENUE, NEW YORK

PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

PAPER

SIXTY-SIXTH YEAR

PAPER

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with PAPER TRADE JOURNAL.

Vol. CVI, No. 7 Thursday, February 17, 1938

Established Sept. 21, 1918
Consolidated Feb. 19, 1925
with PAPER TRADE JOURNAL.

New Giant Newsprint Mill In Production

Ontario Paper Co. Plant At Comeau Bay, Quebec, Ready Four Months Ahead of Schedule Includes Modern Town Carved Out of Wilderness —Mill Now In Operation—Official Opening To Take Place In Spring.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, QUE., February 14, 1938--Preliminary arrangements are now under way for an impressive ceremonial occasion to mark the official opening of the Ontario Paper Company's newsprint mill which has been built at Comeau Bay, Que., by the interests behind the Chicago Tribune and the New York Daily News. This official opening will take place in the late spring or early summer, and in view of the importance of the new industrial center which has been established in hitherto uninhabited wilds on the north shore of the Gulf of the St. Lawrence, some 400 miles east of Montreal, representatives of the federal and privincial governments and many Canadian business organizations will attend.

Mill and Town Rise in Wilderness

The work of establishing this mill, which by the way, was completed four months ahead of schedule and is already producing, has meant much more than building the mill itself. A whole new town has had to be created, with houses, roads, water supply, sewerage, and power. The Ontardes Falls, on the Manicouagan river, 16 miles distant from the mill, have been harnessed to produce 70,000 horse-power. A Hudson Bay Company's department store has been opened, a community building has been completed, a modern theatre has opened its doors, and shops and stores line the main street where but a year or two ago the only human being seen was an occasional Indian trapper or trader.

Largest Industrial Project in Canada

The whole enterprise is the largest industrial project undertaken in Canada since before the depression and the largest newsprint enterprise undertaken anywhere in the world in the same period.

Total Cost of Enterprise Estimated at 30 Million

At the peak of the development more than 5,000 men were employed at Comeau Bay at one time. Figures supplied by some of the larger contractors show that the total labor required for the development, both direct and indirect, was 25,000,000 man hours, which is equivalent to employment of 5,000 men every day for two full years. The amount spent on wages for these workers totalled more than $12,000,000. The total cost of the projects as planned is put at approximately $30,000,000. As indicating what an enormous task was undertaken in manufacturing and transporting materials and machinery, it may be stated that from the time the work was started in the early part of 1936 to the end of 1937 more than 400 ships arrived at Comeau Bay, in addition to the regular gulf port service, carrying equipment and supplies.

The paper manufactured at the mill is for the use of the New York Daily News.

Mead Corp. Buys Hager Strawboard Co.

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, OHIO, February 14, 1938—Sale of the Hager Straw Board and Paper company of Cedarville, Ohio to The Mead Corporation, at Chillicothe, Ohio, was announced by W. W. Galloway, general manager and treasurer last week. The Hager Company was incorporated in 1893 by Albert Hager and his son, Edwin, with a capital stock of only $300. It is reported that $150,000 was involved in the transaction. Both of the Hagers are dead and the principal stockholders are Miss Sarah Hager and Mrs. Charles Galloway, of Chicago, Ill. Fred Zartman of Franklin, Ohio, is president of the firm.

The Mead Corporation will take over the plant, consisting of the warehouse and an 85-acre tract, on April 1. Plans of the Mead Corporation were not revealed.

This is the last of five paper mills in the Hager family.

Preparing Plans for Mill Improvements

Rodrick O'Donoghue, pulp and paper mill consulting engineer, 420 Lexington avenue, New York City, has been retained by the Pejepscot Paper Company of Brunswick, Maine, to make a survey of the company's pulp and paper mills with the object of making improvements. Mr. O'Donoghue has also been retained by the P. H. Glatfelter Company, Spring Grove, Pa., to make preliminary plans for a proposed addition to the company's bleaching system.

Production of Consolidated Co. Stepped Up

New Machine Starts To Produce Coated Paper for Life Magazine, Increasing Daily Capacity 75 Tons — National Labor Board Hearings — Rhinelander Reelects Officers—Labor Mass Meeting—Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, WIS., February 14, 1938—Production was stepped up approximately 75 tons a day by the Consolidated Water Power and Paper Company, Wisconsin Rapids, last week when its new No. 5 machine was placed in operation on coated paper for its "Life" magazine contract. The machine is housed in a large new mill addition completed last summer.

This machine was the first to be specially built to incorporate the patented equipment which coats the paper right on the machine itself. Others in the Consolidated mills were rebuilt to handle the process. A record was set for the speed of manufacture and erection. The order was placed with Rice, Barton and Fales of Worcester, Mass. last May, and the building was rushed to completion while the equipment was being built. It took 63 freight cars to transport the parts.

Mill employes held a christening when the machine was ready to run. A flask of "white" water was broken against a steel drum at the dry end by Miss Eva Hanneman, finisher, while others looked on, including B. F. Raprager, machine superintendent, Arthur A. Anderson, engineer in charge of installation for the manufacturers, W. E. Beadle, master mechanic, Earl Otto, storekeeper, and Howard Richmond, production manager. The machine's capacity ranges from 70 to 75 tons a day, and means the employment of about 100 additional men.

This installation was part of Consolidated's expansion program involving expenditures of about $1,500,000. Work is to be started immediately on the rebuilding of the No. 3 machine at the Biron, Wis. mill to include the coating process. An addition has been built to the finishing room to accommodate three new super-calenders. Three new digesters also have been added, as well as additions to the bleach and water filtration plants. Increased boiler capacity also has been provided.

Labor Mass Meeting Attended By 800

More than 800 attended a labor mass meeting at Lawrence Memorial Chapel, Appleton, Wis., February 11 to hear an address by John P. Burke of New York City, president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers. His subject was "A House Divided."

Mr. Burke explained the rift between the AFL, which he represents, and the CIO, pointing out that even though his organization approved industrial unionism as well as the craft union plan, John L. Lewis and his followers broke with the organization and started their own body.

The program of the AFL, said Mr. Burke, is the signing of agreements with employers, collective bargaining, arbitration and negotiation for settlements with strikes as a last resort, sanctity of union contracts, and opposition to communism. There are 100 national and international unions, all self-governing but all united, he said.

Joseph Briegel of Chicago, general organizer for the AFL, also spoke, as the personal representative of William Green, AFL president. "Labor is willing to play fair with the employer," he said. "Common sense is used in dealings and although racketeers get into the organization from time to time, they are weeded out as soon as they are discovered. Our long experience has taught us to deal only with facts and in that way we are successful despite tricks and cunning that might be employed by smart attorneys."

Mr. Burke also spoke in Milwaukee Sunday, February 13, where an open meeting was arranged by William Koehn, secretary of the Milwaukee District Council of Paper Mill, Waste Paper and Converting Plant Unions.

National Labor Board Conducts Hearings

Hearings were conducted by the National Labor Relations Board at Wisconsin Rapids, Wis. last week to inquire into allegations of unfair labor practices by the Nekoosa-Edwards Paper Company. The exact nature of the charges was not revealed, but it was understood the complaints had been filed by the American Federation of Labor. A trial examiner of the labor board was scheduled to appear, and the company was to be represented by Goggins, Brazeau and Graves, attorneys.

Employes recently organized the Nekoosa-Edwards Labor Union, an independent labor organization, which planned to have representatives at the inquiry. AFL unions also have a part of the representation. It is believed the latter are attempting to discredit the independent group.

D. C. Everest To Address Chamber of Commerce

D. C. Everest, vice-president and general manager of the Marathon Paper Mills Company, Rothschild, Wis., has been selected as the speaker for the annual meeting March 3 of the Chamber of Commerce at Wausau, Wis. He will present a discussion of present-day business conditions.

Budget of Paper Institute To Be $300,000

This year's budget for the Institute of Paper Chemistry, affiliated with Lawrence College, Appleton, Wis., will be $300,000, Dr. Thomas N. Barrows, president of the college and director of the institute, told a group of business and professional men attending a joint meeting of service clubs and the Appleton Chamber of Commerce last week. In the 9-year period since the Institute was started, it has spent $1,350,000. It started with a staff of five persons and with three students, and an annual budget of $40,000. Today it has a staff of 75, has 44 students, a $300,000 budget and buildings valued at

$320,000. Its equipment is estimated at a value of $500,000, most of which was donated.

President Barrows announces that the board of trustees of the Institute will meet Monday, February 21, in New York City. Administrative officers who will attend with him are Ralph J. Watts, treasurer, John Strange, secretary, and Westbrook Steele, executive director. Staff members will be Dr. Otto Kress, technical director, Dr. H. F. Lewis, Dr. J. A. Van den Akker and Howard W. Morgan.

Rhinelander Paper Co. Re-elects Officers

Directors and officers of the Rhinelander Paper Company were reelected at the annual meeting of stockholders last week at the company's offices at Rhinelander, Wis. The officers are: Folke Becker, president and treasurer; E. A. Forbes, vice-president; Allan Brown, assistant treasurer; Paul Browne, secretary, and Miss Ruth Neuman, assistant secretary. J. S. Daniels, Earl A. Korth, W. D. Brown and R. L. Caldwell are the additional directors.

President Becker presented a summary of the year's operations, which he termed "satisfactory in view of business conditions." Expansion of operations was brought about by the construction of an addition and installation of a new paper machine. The company also acquired the buildings of the Rhinelander Refrigerator Company and is preparing to carry on some of its converting operations there. The No. 3 Yankee paper machine is now being rebuilt, and further improvements are contemplated.

Superintendents to Meet at Atlantic City

Atlantic City has been selected for the second consecutive year for the annual convention of the Pennsylvania-New Jersey Division of the American Pulp and Paper Mill Superintendents Association, Inc., which will be held May 6-7, according to an announcement made this week by Oscar Stamets of Milford, N. J., Chairman of the organization.

Headquarters for the division, will again be the Ritz-Carlton Hotel, where, it is anticipated, over 300 members will convene.

In addition to the business sessions, to be held in the Trellis Room of the Ritz, an elaborate program of entertainment is being planned, which will include the annual banquet and floor show, to take place in the Main Dining Room, Saturday, May 7, bringing the convention to a close.

Osborn Paper Co. Signs Agreement

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., February 14, 1938.—Thomas R. Hutson, Indiana labor commissioner, last week announced at Indianapolis that an agreement had been signed between the Osborn Paper Company of Marion, Ind., and the federal local union, an American Federation of Labor affiliate. Hutson said the agreement, to run a year, makes the union sole bargaining agency for the factory's 125 workers. It contains no wage or hour provisions.

Mr. Hutson said he plans to bring officials of the Indiana Fiber Products Company of Marion, and union representatives together some time this week for further conferences toward settlement of the strike that started December 20.

Sutherland Paper Buys Toledo Firm

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, MICH., February 10, 1938—The Sutherland Paper Company purchased outright the Champion No-Leak Dish Company of Toledo, Ohio, and has already transferred and installed the equipment of the latter concern to Kalamazoo. The Toledo company makes a paper butter dish which can also be used as a general utility receptacle for retailing of other bulk articles.

Milton Zeiser, superintendent of the plant in Toledo, has moved to Kalamazoo and will be production manager of the new unit. The former president of the Toledo Company, George A. Brandenburg, has accepted a position in the research department of the Kalamazoo Vegetable Parchment Company. The Sutherland Company is operating at a capacity highly satisfactory to the management, with a steady demand for its numerous lines of paper specialties. The unit, manufacturing oil cans, has been recently consolidated with the regular paper can department.

Goes With Crocker-McElwain Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., February 14, 1938.—William Dalrymple has again returned to paper manufacturing in Holyoke. He has begun his new duties as superintendent of the Crocker-McElwain Paper Company succeeding Stephen G. Stapley who resigned in December to become head of a paper mill in Thorold, Can. Mr. Dalrymple came to Holyoke in 1924 and became associated with the Valley Paper Company for two years. He then became superintendent of the Parsons division of the American Writing Paper Company until 1932 when he resigned to become superintendent of the Lee Paper Company of Vicksburg, Mich.

J. M. Behnke Goes With Knowlton Bros.

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., February 14, 1938—John M. Behnke has been named technical director of Knowlton Brothers Inc. to succeed Edgar Turnbull who recently resigned to take a similar position with the Wardlow-Thomas Company, of Middleton, Ohio. Mr. Behnke comes from Appleton, Wis., and plans to take over his new duties about March 1. He will have complete supervision of the research and technical laboratories of the company. He was formerly associated with the Kimberly-Clark Corporation, of Neenah, Wis., and also served for a number of years as chief chemist of the Riverside Paper Mills, of Appleton, Wis.

Sulphite Paper Men to Hold Luncheon

At the annual meeting of the Sulphite Paper Manufacturers Association, which will be a luncheon meeting to be held at 1:00 P. M. on Monday, February 21, in the Carpenter Salon at the Waldorf-Astoria Hotel, New York, D. Clark Everest, President of the American Paper and Pulp Association, will give a short address to welcome members at the opening of the convention.

H. O. Nichols of the Crown Willamette Paper Company, who is general chairman of the Sulphite Paper Manufacturers Association, will preside at this meeting.

Pick Up in Business Cheers Chicago Trade

All Grades of Paper Show Slight Improvement As Demand Broadens — Industrial Relations Conference To Meet — Illinois Paper Manufacturers Anxious About New Coal Code Prices — Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, ILL., February 14, 1938—The Chicago paper market suffered slightly from unseasonable weather and a slight back up on commitments during the week just passed. However, it is stated that only a small improvement would be sufficient to place the mills and jobbers in a much better position because of the comparative scarcity of stocks available. Specifically, all lines continue to report a genuine pick-up since the first of the year despite the slight decline this week. The Kraft market showed a marked indication of broadening out. Groundwoods remained about the same according to local reports, as did newsprint. Fine papers in general were not as active during the week although some in the trade reported a continuation of prominent inventory buying. Paper board markets were firm and a greater increase in building papers was noted. The waste paper market showed more semblances of organization and prices were reported as firming up. In all cases, including waste, reports evidenced no genuine concern over the actual market condition itself.

Midwest Interested in Salesmen Assn. Meeting

Considerable interest is being aroused in Chicago over the appearance of General Hugh Johnson at the annual session of the Salesmen Association of the Paper Industry to be held February 22 in conjunction with the annual meeting of the National Paper Trade Association in New York City. The appearance of General Johnson, already well known to Chicago audiences, will be an additional magnet to attract what is expected to be a record crowd at all sessions extending from February 21 to 25. The midwest division of the Salesmen Association is again handling the details with respect to special transportation to the New York meetings.

Industrial Relations Conference Meets

Chicago will next week be the host to an important Industrial Relations Conference sponsored by the American Management Association. Meetings to discuss readjustments for the ending of industrial strife are to be held at the Palmer House February 15, 16 and 17. The meeting is of importance to the paper industry not only because of the attention now being given to the problem itself but also because of the presence of several well known paper executives on the executive board of the sponsoring association. Mr. J. H. Macleod, vice president of the sales division of the Hinde & Dauch Paper Company, is vice president in charge of the industrial marketing division of the American Management Association. Mr. George E. Rogers, insurance manager of the Robert Gair Company, is a member of the board of directors as are J. Kindleberger, chairman of the board of the Kalamazoo Vegetable Parchment Company and S. F. Shattuck, vice president of the Kimberly-Clark Corporation. The American Paper and Pulp Association is also a cooperating association in the American Management Program.

Personnel Trends, Importance of the Supervisor in Labor-Relations, Collective Co-operation, Company Staff Meetings and Clearing Up of Employee Misinformation are among the important subjects to be discussed at the three day conference.

New Coal Code Prices Create Anxiety

Several Illinois paper manufacturing concerns are evidencing deep interests in the new coal code prices which are alleged to be discriminating against Illinois manufacturing plants and threatening to drive employers to other states where lower prices have been fixed by the national bituminous coal commission. Recently E. W. Weston, secretary of the Terre Haute Paper Company, which has plants at both the Indiana city and Peoria, Illinois, said that a disproportionate increase in Peoria coal prices will make it necessary for the company to close the Peoria plant or operate it only to fill orders beyond the capacity of the Indiana mills. The company manufacturers straw paper and tube board and employs 85 men at Peoria with an annual payroll of over $125,000. The Peoria plant was purchased in 1933 for overflow orders but over $50,000 has been spent since last June on modernization to make the Illinois plant a low cost plant. Now the coal decisions threaten to place this concern and others at a disadvantage of 50 to 60 cents a ton on coal costs over the Indiana plants. Unless changes are made, and Illinois is up in arms over the procedure of the commission, the Terre Haute Paper Company is reported to plan to run for 90 days to determine production costs and then make a decision as to the future. As an example of the conditions on one city, the Peoria Association of Commerce estimates that the increase in prices under the code will add $800,000 a year to the coal bill of Peoria industrial consumers.

Roger Little Goes to Swigart Co.

Roger B. Little, for the past two years vice president and general manager of the Milwaukee division of the Dwight Brothers Paper Company, has accepted a position on the sales staff of the Swigart Paper Company according to an announcement made on February 1 to an assemblage of printers at an evening meeting held at the "Gallery of Printed Ideas" sponsored by the Swigart Paper Company.

W. A. Rauth Heads Rauth Brothers

Recent changes in the executive personnel of Rauth Brothers, 727 West Lake Street, Chicago, and which followed the death of Peter O'Leary, bring W. A. Rauth to the presidency of the coarse paper and twine concern. A. O'Leary becomes vice president to take the place vacated by Mr. Rauth in ascending to the presidency.

P.T.A. Announce Convention Delegates

Philadelphia Paper Trade Association Announce Selection of Delegates To National Convention — Safety Record of DuPont Best In Company's History — Cedarized Wall Paper, A New Product for Mothproofing.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., February 14, 1938. — The first meeting of the year of the newly elected Board of Governors of the Paper Trade Association of Philadelphia was held at he Down Town Club on Wednesday, February 9th, with W. B. Killhour, presiding. Delegates appointed to attend the National Association Convention are President W. B. Killhour for fine paper division, and Charles A. Wilder for the wrapping paper division. Doris E. Lewis, executive secretary of the Paper Trade Association will also be in attendance, having made reservation at Hotel Lexington.

Arthur L. Feierman has been appointed chairman of the committee to make arrangements for the thirty-third annual banquet of the Waste Paper Dealers' Association, which will be held on Tuesday evening, March 1st, in the Crystal ballroom of the Broadwood Hotel. Serving on the committee with Mr. Feierman are Harry Bailey of Hemingway Company, George A. Di Ienno and George French. Mr. Feierman states that this will be the most outstanding banquet in the history of the Association, and neither time nor money will be spared to make it a success. Tickets are $5.00 each, and already many reservations have been received.

Safety Record of DuPont Company

The safety record of the DuPont Company compiled during 1937 was the best in its long history, the company announced today. With employment 11 per cent over the previous year, DuPont plants experienced a "frequency rate" of 1.85 as against 2.02 in 1936, the most impressive safety year up to that time. The "severity rate" in 1937 was .76 well below the 1936 average of .86. Frequency rates measure the number of injuries for each 1,000,000 exposure hours. The severity rate is the number of days lost per 1,000 exposure hours.

During the year, one plant achieved a record surpassing any ever reported by an industrial unit when it completed two full years without a major injury, during which time 4,109 men and women, worked 11,362,000 exposure hours. Forty-seven DuPont plants, laboratories and construction projects worked through the entire year without a single injury serious enough to cause an employe to lose time from work.

Safety education within the company has formed an important part of the managerial program, and has been intensified within recent years as the wide development of new products multiplied safety problems. This effort has produced a constant lessening of injuries, the past year's frequency rate ratio of 1.85 being contrasted to 12.80 in 1925, considered a good record at that time.

Cedarized Wallpaper Patented

Many new products pertaining to the wallpaper industry have been placed on the market that forecasts increasing business and interest in that field. Among the latest wall paper products patented is a cedarized wallpaper that is considered specially adaptable for a mothproof cedar closet.

As wallpaper has been gradually entering into practically every room in the house, and its washable qualities having recently put it into the kitchen and bathrooms with practical results this latest specialized use is considered by many homeowners as ideal. It is made of real cedar from the heart wood of the Tennessee aromatic red cedar, so treated that it can be rolled, sold and applied like ordinary wall paper.

If used as a lining for bureau drawers it will also protect small articles of wearing apparel by its moth repellent effect. As a lining for wooden chests it transforms them immediately into cedar chests.

Goes With Morart Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., Feb. 14, 1938.—Ralph N. Humes for 22 years with the American Writing Paper Company and its present successor, the American Writing Paper Corp., has resigned to accept a position with the sales force of the Morart Paper Company of this city. Mr. Humes has specialized in the papeterie and greeting card field for the past 19 years and is well known in the New England and southern territories.

To Represent Brightwood Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., February 14, 1938—F. T. Burkhardt of this city has been named sales representative of the Brightwood Paper Company of Adams, Mass. He will carry on his work from his offices in this city. Mr. Burkhardt has been sales manager of the Keith Paper Company of Turners Falls, Mass., and prior to that was in charge of sales for the Parsons Paper Company of Holyoke.

William S. Fowler Named Sales Manager

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., Feb. 14, 1938.—William S. Fowler of this city has been named sales manager of the Hampden Glazed Paper and Card Company. He is secretary of the organization and has been advertising manager. He is the son of Norman N. Fowler of Springfield, president of the company.

Patten Mill Equipment Sold

The Fox River Paper Company, which acquired all assets of The Patten Paper Company, Ltd., Appleton, Wis., on January 21, 1938, has sold the paper machines and all other equipment to Mansel L. Rankin, paper mill broker, of Sandusky, Ohio, for liquidation.

Financial News of Pulp and Paper Industry

Hinde & Dauch Earnings Up With Production At High Level—Operating Profit of St. Lawrence Paper Doubled — Brompton Net Profit Equals $1.34 Per Share—Dexter Sulphite Elects Directors — Other Late News.

New York Stock Exchange

High, Low and Last for the Week Ending February 16, 1938

	High	Low	Last
Armstrong Cork Co.	33½	31⅞	33
Celotex Corp.	21½	21	21
Celotex Corp., pf.	56	56	56
Certain-Teed Products Corp.	8⅜	7¾	7⅞
Certain-Teed Products Corp., pf.	32¼	29	29
Champion Paper & Fibre Co.	29	28¼	28¼
Champion Paper & Fibre Co., pf.	104	104	104
Congoleum-Nairn Co.	23¼	22¾	23
Container Corp. of America	14½	14	14½
Continental-Diamond Fibre Co.	8⅜	7¾	7¾
Crown-Zellerbach Co.	10	9½	9⅞
Flintkote Co.	18¾	16⅝	17½
Robert Gair	4⅛	3⅞	4
Robert Gair, pf.	12¾	12¾	12¾
International Paper & Power	7½	7⅛	7½
International Paper & Power, pf.	31½	29¼	30
Johns-Manville Corp.	79½	75	76¼
Johns-Manville Corp., pf.	123½	123½	123½
Kimberly-Clark Corp.	22	21⅞	22
MacAndrews & Forbes	30¼	30	30
MacAndrews & Forbes, pf.	126	126	126
Masonite Corp.	32	30⅝	31¾
Mead Corp.	13	13	13
Mead Corp., pf.	55	55	55
Paraffine Companies, Inc.	39½	39¼	39¼
Paraffine Companies, Inc., pf.	94	93½	94
Ruberoid Co.	20⅝	19⅛	19⅛
Scott Paper Co.	41½	39½	40
Sutherland Paper Co.	23¾	20½	23
Union Bag & Paper Corp.	11½	10⅜	10¾
United Paperboard Co.	5	5	5
U. S. Gypsum Co.	68	65⅛	65⅛
U. S. Gypsum Co., pf.	169¾	169¾	169¾

New York Curb Exchange

High, Low and Last for the Week Ending February 16, 1938

	High	Low	Last
American Box Board Co.	8⅝	8½	8⅝
Brown Co., pf.	26½	25	25
Great Northern Paper	29¼	28⅜	28⅜
St. Regis Paper Co.	3⅛	3	3⅛
Taggart Corp.	4½	4½	4½

Hinde & Dauch Profits Set New Peak

TORONTO, ONT., February 14, 1938—In line with a new peak in operations, the annual statement of Hinde & Dauch Paper Company of Canada, Limited, presented to shareholders at the annual meeting in Toronto, reported gross profits of $852,575, as compared with $721,872 in 1936. Sidney Frohman, president, stated that 1937 had some abnormal ups and downs that were a test of executive and organizing competence. As to the prospect for 1938, Mr. Frohman stated: "While the industries of which we are a part experienced a slight slackening in demand in the latter part of 1937, and are still not running at as good a figure as they did last year at this time, it is a definite fact that the extreme recession felt by similar industries in the United States during the past four or five months has not been experienced in Canada, so it is very possible that with any upturn in business in the United States these Canadian industries may pass over the extreme low demand altogether and enjoy a continued expansion, the basic factors for which are generally evident".

L. F. Winchell, vice-president and general manager, reported that the sales volume of the company for 1937 totalled $6,538,772, representing an increase of 15 per cent over 1936. He alluded to the hectic runaway market which developed last year in war materials. The company anticipated to a considerable extent its requirements of raw materials.

The recession in the United States, according to Mr. Winchell, has resulted in some influx of competitive products from the United States on a basis that was considered as dumping. No serious results has as yet developed on that score, he stated, adding that so far the company had not been forced to make any price concessions. Directors were re-elected.

Big Profit Gain for St. Lawrence Paper

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, QUE., February 14, 1938— Record sales, operating profits more than doubled, and a moderate reduction in working capital are features of the annual report of the St. Lawrence Paper Mills Company, Limited, for 1937.

Operating profits are up $411,000 at $747,794 and gross profit at $871,813 compares with $336,929 in 1936. After deducting depreciation of $625,000 and repletion of $65,426 net earnings stood at $181,387 equal to $1.27 a share of preferred stock. The balance sheet shows current assets of $2,524,835 compared with $2,055,615 in 1936, while current liabilities gained $491,000 to $2,212,808, leaving working capital of $312,027 contrasting with $334,633 in 1936. Inventories are shown $571,000 higher at $1,699,036 and receivables down $177,510 to $692,948.

In presenting the report to shareholders, President J. I. Rankin comments, in part, as follows:

"Newsprint sales in 1937 amounted to 147,417 tons, compared with 123,812 tons in 1936 and 108,348 tons in 1935. The sales in 1937 were the largest in the history of the company.

"Reference was made in the 1936 report to the bringing into production of the sixth paper machine which had not been operating since 1931. This was accomplished during the year and the capacity of your plant was increased from 150,000 tons per annum to 180,000 tons per annum. The increase in tonnage capacity necessitated, also, a complete overhauling of the wood handling and grinding equipment and the resultant expenditure on plant account was $789,541."

Brompton's Profits Up

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 14, 1938.—Brompton Pulp and Paper Company's 1937 report shows consolidated total income of $744,533, as compared with $534,742 for 1936. After provision for depreciation, depletion, taxes, etc., there was a net profit of $403,281, as compared with $116,191 in the preceding year. This is equivalent to $1.34 a share, against $0.38 for 1936. After payment of dividends totalled $330,000, there remained a balance of $73,281 to be added to surplus account, which now stands at $561,126.

The balance sheet shows working capital slightly higher at $2,078,951.

In presenting the report to shareholders, President Arthur F. White comments, in part, as follows:

"Continuing the policy of improvement to plant and equipment, the amount of $433,628.35 was expended during the year and the company's manufacturing plants are now approaching a high state of efficiency. The programme of improvement is nearing completion and expenditures in this direction will be substantially less in 1938."

Dexter Sulphite Elects Directors

[FROM OUR REGULAR CORRESPONDENT]

DEXTER, N. Y., February 14, 1938.—The annual meeting of stockholders of the Dexter Sulphite, Pulp and Paper Company, was held last week at which A. F. Richter and H. B. Evans, of Watertown, were named directors. Mr. Richter is also consulting engineer for the Stebbing Engineering and Manufacturing Company. Mr. Evans was appointed to fill the vacancy caused by the recent death of Herbert A. Long while Mr. Richter increases the original number of directors. The other directors re-elected include H. W. Conde, C. A. Dunham, C. A. Phelps, S. S. McCumber, B. A. Gray and C. E. D'Auteuil, of Quebec. Official elected are Bernard A. Gray, president and treasurer; Harold W. Conde, vice president, and H. B. Evans, secretary.

Hoberg Net Income Increased

[FROM OUR REGULAR CORRESPONDENT]

GREEN BAY, Wis., February 14, 1938.—Net income of the Hoberg Paper Mills, Inc., was $180,418 for 1937, according to a report issued by J. M. Conway, president and general manager. This was an increase of $32,248 over the year 1936, when the net was $148,710. The 1937 earnings are equal to $1.51 per common share after deduction of dividends on preferred stock.

Dividends paid on common and preferred stock last year totalled $109,574. In addition, the company spent $205,131 on additions and improvements to the property.

Consolidated Earns $1,301,658

Directors of Consolidated Paper Company, Monroe, Mich., following annual meeting of stockholders ordered payment of cash dividend of 25 cents per share on common stock, payable March 1, to stockholders of record February 18. The dividend aggregates $187,500. Net earnings of company are listed at $1,301,658, equal to $1.73 a share in comparison with $1.82 in 1936. The company has no preferred stock. The company owns plants at Monroe, River Rouge and Aurora, Ill. The officers and directors were reelected.

Scott Paper Co. Earns $2.20 on Common

The Scott Paper Company reports as follows for 1937: Net earnings for the common stock of $1,254,280, equal $2.20 a share, against $951,308, or $1.66 a share, in 1936, based on 569,984 shares now outstanding. Thomas B. McCabe, president, stated that net sales of $13,843,000 made a new high record last year and were 19.1 per cent above 1936. Capital expenditures for additions and improvements to the Chester plant of the company amounted to about $1,700,000, he said.

Indianapolis Reports Improvement

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, IND., February 14, 1938—Although the volume of most grades of paper sold here during the past week is well below that of the same time a year ago, there is an improvement shown over the previous month, which at least is some encouragemen to the industry. One of the brightest factors in the general scheme is the fact that credit conditions are good. Jobbers say that consumer experience in the last few years apparently have caused them to be careful of their buying and their credit. Prices are firmly held in the entire list.

Bond and book papers seem to lead in the fine paper field. Demand is not satisfactory, but there is a slowly expanding market and the trade expects this to continue into the coming month. Covers showed about the same volume as the week before. However, there were inquiries which indicate an expansion in this line too. Prices showed no appreciable change last week.

A fair volume was reported in cellophane and waxed papers. Manufacturers and jobbers of waxed paper say the bakery business is holding up well. Tissues also continue in good demand.

Newsprint is in good shape, according to jobbers. Both metropolitan and country papers seem to be getting their share of advertising and the volume is about on a par with this time a year ago. Buyers, however, continue to be wary and long time contracts, particularly with the smaller papers, are rather scarce.

Paper box production in some instances has been held up during the last week or so by intermittent strikes in various parts of the state. Other container men say there is a fair volume, but not as large as a year ago. Inquiries are increasing, however.

Paper stock men report but little activity in the rag and paper field, particularly in the poorer grades. This is true of the entire rag market, but there is some activity in the better grades of paper stock.

Toronto Paper Box Men Meet

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, ONT., February 14, 1938—The annual meeting in Toronto last week of the Toronto Carton Council attracted a gathering of nearly 300. It was an open night for the most part and was attended by many of the families of the boxmen. There was an interesting musical and literary program in which many of the members themselves participated. Bart Sproule, the new chairman, presided and the chief item on the program was an address by Professor C. T. Currelly, director of the Ontario Museum, who sketched the manufacture of paper from the early days onward to the present time. The directors of the Canadian Paper Box Manufacturers' Ass'n also met as part of the Council and decided to hold this summer's annual meeting of the Association at Niagara Falls, Ont., on June 13 and 14.

To Represent Mathias Paper Co.

BOSTON, MASS., February 14, 1938—Harry M. Cranmer has recently liquidated his business, which included the handling of box coverings, and has become representative of the Mathias Paper Company. Mr. Cranmer is continuing at the same address, 211 Congress street.

Obituary

Michael J. Redmond

Michael J. Redmond, general superintendent of the Kalamazoo Paper Company and a member of the board of directors of that company, died in a Los Angeles hospital, after a brief illness on February 10. Mr. Redmond left Kalamazoo on January 31 so visit a brother who resides in Los Angeles. He had been connected with the paper industry in Kalamazoo continuously for 57 years, starting with the Kalamazoo Paper Company in 1881 as a screen boy under the late Noah Bryant who was superintendent at that time, came up through the ranks as machine tender, superintendent, and in 1914 was made general superintendent and in January, 1923 was elected to the board. He was one of the organizers of the American Pulp and Paper Mill Superintendents Association and was on its executive board for many years. In 1935, he was given a life membership in the association, an honor which he highly prized.

MICHAEL REDMOND

Mr. Redmond was born in Hillsdale County, Mich., December 4, 1865 and came with his parents to Kalamazoo in 1878. He was endowed with an outstanding personality, being highly esteemed by his business associates and enjoyed a host of friends both in the industry and outside.

Burial services will be held in Kalamazoo. He is survived by three daughters, Mrs. Dorothy Wooley, Detroit, Mrs. Evelyn Lemon, Detroit, and Helen Redmond of Kalamazoo; five brothers, Cornelius of Los Angeles, William J., John F., Patrick J., and D. J. Redmond, all of Kalamazoo, two sisters, Mrs. Ella Pickett and Mrs. Mary Pickett of Kalamazoo, and seven grand children.

Eugene W. Peppard

Eugene W. Peppard, sales manager of The Parker-Young Company, Lincoln, N. H., died February 6 at the Holyoke Hospital, Holyoke, Mass., in his 45th year, after a brief illness.

Mr. Peppard had been associated with The Parker-Young Company for 20 years and previous to being sales manager, a position he had held for the last year, was a sales representative. He was very popular, having a host of friends in the industry.

He leaves his widow, the former Gladys Ransdell; a daughter, Miss Eugenia Pappard; two sons, Elliot and Raymond Peppard; his mother, Mrs. Alice Peppard of Plymouth, N. H.; a brother, John P. Peppard of Belmont, Mass., and a sister, Mrs. Stafford Rogers of Winchester, Mass.

George E. Greene

George E. Greene of 277 Park Avenue, New York, former president of the Niagara Paper Mills of Lockport, N. Y., died February 13, in Hollywood Beach, Fla. Mr. Greene, who was 70 years old, died of heart disease after several weeks of failing health. He went to Florida at Christmastime in the hope of recuperating in the milder climate.

A civil engineering graduate of Lehigh University, Mr. Greene helped build the Lehigh Valley Railroad line between Rochester and New York. Later he settled in Lockport and acquired many interests there. Five years ago he retired from the presidency of the Niagara Paper Mills after having introduced many improvements in paper manufacture.

His widow, Genevieve Weaver Greene, and a son, Henry B. of Lockport, survive.

Bert A. Allen

Bert A. Allen, 66, president of the Allen Paper Company, Chicago, died February 3 at his home in Chicago. He had been ill since November.

Mr. Allen, widely known in the paper industry, was born in Shabbona Grove, Ill., and came to Aurora, where he resided for many years, when 18 years old. He began his business career with Marshall Field & Company, Chicago. In 1895, he organized the Carter & Allen Paper Company. In 1899 the company was reorganized as the Allen Paper Company.

Mr. Allen was a member of Aurora Lodge 254, A.F. & A.M. and several Masonic orders and clubs.

Surviving is one son, Wheaton Allen, of Chicago.

William Alexander, 2d.

William Alexander, 2d., 27, production executive of the Scott Paper Company, Chester, Pa., who resided at Swarthmore, Pa., died February 6 at the Hackensack Hospital of acute lymphatic leukemia.

Mr. Alexander was born in Edinburgh, Scotland and came to this country when a child. He was educated at the Polytechnic Institute, Troy, N. Y. and the Massachusetts Institute of Technology. He had been associated with the Scott Paper Company since 1932.

Surviving, are his mother and sister.

F. D. Morris

F. D. (Charm) Morris, 60, associated with The Union Paper and Twine Company, Cleveland, died February 1 at his home in Columbus, Ohio.

Mr. Morris had been engaged in the paper business for forty years, beginning his career with the Central Ohio Paper Company. For the last twenty years Mr. Morris had been associated with The Union Paper and Twine Company and was widely known in the paper and printing industries in Cleveland.

To Curb Governmental Interference

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 14, 1938. — Louis E. Vose, vice-president of Hollingsworth & Vose Company, East Walpole, Mass., was among a group of 28 representatives of smaller business interests from various sections of New England who met at the Boston City Club Saturday and formed what they predicted soon would be a national organization powerful enough to curb alleged governmental interference in industry.

Mr. Vose read part of a communication from Secretary Roper, which, he said, "made his blood boil." He quoted the secretary as saying the smaller business men should acquaint themselves with the problems of the government.

"Why it's exactly opposite to that," said Mr. Vose. "There should be greater familiarity on the part of government with the smaller business man's problem."

Miss Mary Dowd, of the Corrugated Box Company, Worcester, Mass., was elected secretary of the group.

John W. Fitzgerald, of the Ames Envelope Company, Boston, was among those attending the meeting.

The group held a five-hour session, unanimously adopting a resolution calling on other small business people in the northeastern section of the country to register their opinion of the 23 recommendations for reform submitted to President Roosevelt.

The 28 who attended Saturday's meeting also attended the two-day session at Washington at the personal invitation of the president.

"Meet Me In The Club"

The Waldorf-Astoria has reserved the East Foyer of the Ball Room, on the Third Floor, as a Club Room and general meeting place for the use of those attending the convention of the American Pulp and Paper Association.

In the past the association members have congregated in the lobby especially during the noon hour and in the early evening. Because of the crowding it has been impossible for members to meet each other as they may have arranged. Moreover, the crowding has seriously handicapped the hotel in maintaining its high efficiency in service.

The Club Room which will be comfortably fitted up and in which refreshments can be obtained, is especially designed to permit members to meet each other according to arrangements. The Waldorf-Astoria will give especial attention to their comfort in this room.

Ingleton Schenck, Sr., Dead

Ingleton Schenck, Sr., for a long number of years prominently connected with the paper industry, died January 26 at Long Beach Cal. Mr. Schenck was connected with the Great Northern Paper Company at Millinocket and Madison, Maine, and was general manager from 1900 to 1928. In the latter year he retired from active service and moved to California. Mr. Schenck was born in Trenton, N. J., July 29, 1860.

He is survived by two sons—Ingleton Schenck, Jr., of Malone, N. Y., and Frederic Van Nydeck Schenck, of Long Beach, Cal.

Newsprint Production Lower

The Newsprint Association of Canada reports that newsprint production in the Dominion in January totalled 222,500 tons, a reduction of 23.2 per cent from the 289,634 tons produced in January, 1937. During the month Canadian shipments totalled 168,960 tons, a reduction of 33.4 per cent. from the 253,815 tons shipped a year ago. Production thus exceeded shipments by 31.7 per cent.

In a note appended to detailed statistics the Association says:

"As was expected, January figures of production and shipments showed substantial declines compared to a year ago. The decrease in production and shipments by Canada and Newfoundland was greater than by U. S. mills.

"While North American shipments were down 31 per cent. from January, 1937, production was only 20 per cent. less, as manufacturers restored their stocks to more normal levels and prepared for water shipments later in the year.

"The total gain in stocks held by North American manufacturers during the month was approximately 75,000 tons. At the end of January, such stocks were very close to the level of one year ago. No January statistics are yet available for publishers' stocks but at the end of December such stocks were approximately 385,000 tons higher than at the end of 1936.

"Total shipments to the United States from all North American suppliers were 90,000 tons less than in January, 1937. No figures are yet available for U. S. imports from Europe but they are believed to be around the same level as last year.

"Consumption by U. S. publishers in December, 1937, was down 5.4 per cent. from December, 1936, as against a decline of 14.5 per cent. in November.

"January figures for U. S. advertising are not yet available but are known to be below last year."

W. H. Scott in Automobile Accident

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., February 14, 1938.—Friends of William H. Scott, formerly of this city and now of Bennington, Vt., have learned of the serious injuries suffered by him and the death of Mrs. Scott in an automobile accident on the Bennington-Troy road early this week. Mr. Scott is in Putnam Memorial hospital, Bennington suffering from chest injuries.

While in Holyoke, Mr. Scott was superintendent of the Amherst Wax Paper Company and in 1926 became superintendent of the Bennington Wax Paper Company.

Paper Makers Sail for Australia

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., February 12, 1938—With a view to aiding Australians in production of pulp and paper along lines used in British Columbia, four employees of the Pacific Mills Ltd. at Ocean Falls, B. C., have left that company and are now en route to the Antipodes. Frank Christie, G. S. Hayden, and C. Jeffreys have sailed from Vancouver for Adelaide while H. K. Richardson has left for Sydney.

Kastner Now With Lamonte & Son

Joseph Kastner, Jr., has become associated with George Lamonte & Son, of Nutley, N. J., and will be located at the headquarters in that town.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

New York, N. Y.—The Cosmo Container Corporation, 132 West 21st street, manufacturer of corrugated paper boxes and containers, has leased the two-story and basement building at 510-14 West 34th street, 60 x 98 feet, and two-story annex, 20 x 45 feet, and will occupy for plant, expanding present capacity.

Front Royal, Va.—The American Viscose Corporation, 200 Madison avenue, New York, N. Y., manufacturer of viscose rayon products, is pushing construction of new fiber mill at Front Royal, where large tract of land was acquired a few months ago, as previously reported in these columns. Plant will consist of a large group of one and multi-story units and buildings are scheduled to be completed next May, when installation of machinery and equipment will begin. This will require a number of months, with plant completion now expected early in January 1939, when it will be placed in operation at once. Project will include a power plant, pumping station and other mechanical departments, and is estimated to cost close to $2,000,000, with equipment. At a later date it is proposed to build a second unit, duplicating the plant now in progress, developing the largest mill of its kind in the world. James Bennett is company engineer in charge of erection.

White Pigeon, Mich.—The Eddy Paper Corporation, Three Rivers, Mich., has plans maturing for new power plant at branch mill at White Pigeon, used for the manufacture of coated and other paper stocks, folding box board products, etc. Plant will include turbo-generator unit, boiler and other auxiliary equipment, and is estimated to cost close to $300,000, with equipment. It is expected to begin work at early date.

Darlington, S. C.—The Dixie-Vortex Company, 24th street and Dixie avenue, Easton, Pa., manufacturer of paper drinking cups and allied products, has work nearing completion on new branch plant at Darlington, recently referred to in these columns and will have the new unit ready for operation at early date. Facilities are being provided for large capacity. It is reported to represent an investment of close to $100,000, including equipment.

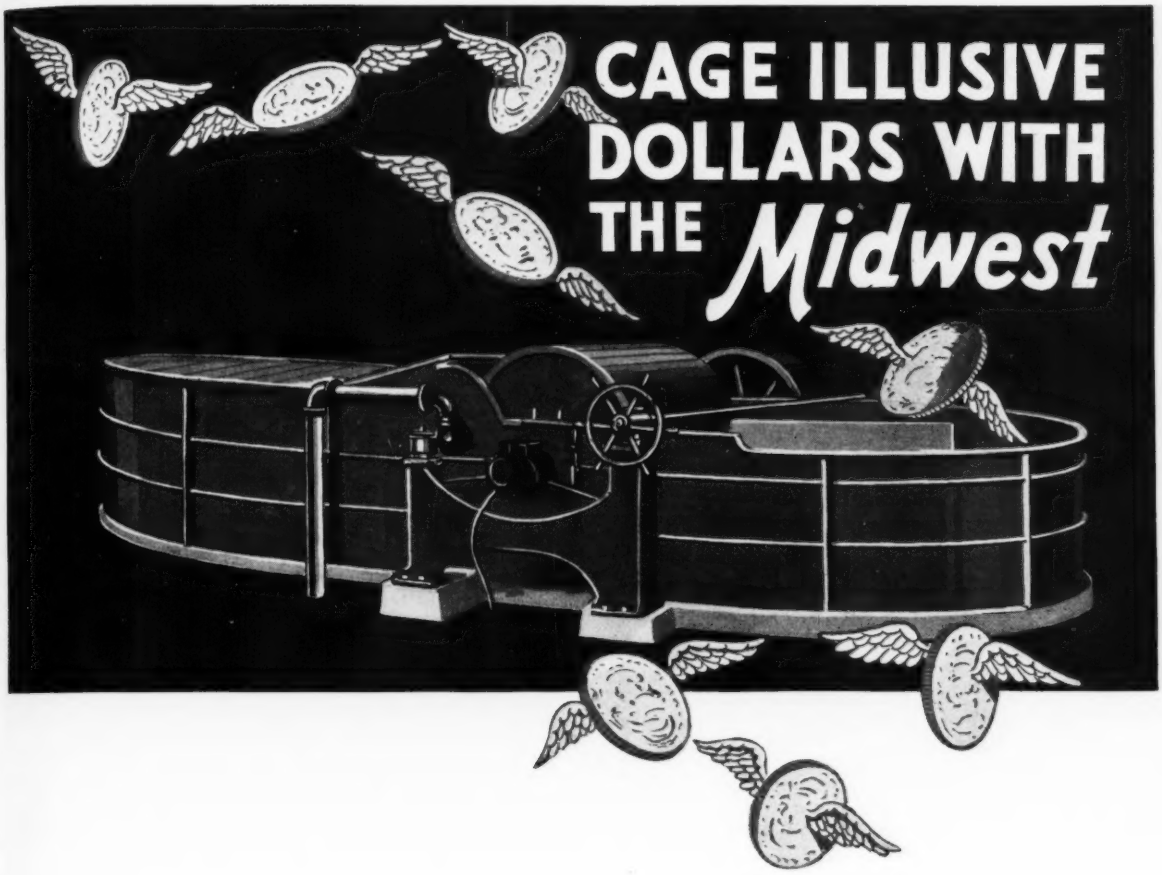
Rockford, Ill.—The Southern Kraft Corporation, 220 East 42nd street, New York, N. Y., a subsidiary of International Paper Company, same address, is said to have closed negotiations with the Eddy Paper Corporation, Three Rivers, Mich., for the purchase of its mill properties at Rockford, with the exception of company box manufacturing plant, operated in the name of the Rockford Fibre Container Division, for a consideration of $691,200. Purchasing company will take over property at early date and will operate in conjunction with recently acquired mill of the Container Corporation of America, Inc., at Cincinnati, Ohio, lately noted in these columns. The Eddy company has arranged for the purchase of an amount of kraft board from the Southern Kraft Corporation, totaling about 102,000 tons during a period of five years, which the latter will furnish from its Rockford mill, following operations under company ownership.

Los Angeles, Cal.—The Armstrong Cork Company, Lancaster, Pa., manufacturer of insulating board products, cork board, etc., has begun erection of new one-story mill on 28-acre tract of land recently acquired in vicinity of Patata street and Wilcox avenue, near South Gate district, previously referred to in these columns. It will be 85 x 240 feet, with office building on adjoining site, power house and other operating buildings. It is estimated to cost about $300,000, including equipment. Lindgren & Swinerton, 605 West Olympic boulevard, Los Angeles, has contract for erection. At a later date the company proposes to construct an additional plant unit of about like size.

Plymouth, N. C.—The Eddy Paper Corporation, Three Rivers, Mich., is securing a substantial interest in the North Carolina Pulp Company, Plymouth, through the purchase of convertible notes of preferred stock, totalling about $800,000, and will secure sulphite pulp from the new mill of the latter company. The North Carolina company is a subsidiary of the Kieckhefer Container Company, Delair, N. J.

Nipigon, Ont.—The Lake Sulphite Pulp Company, Ltd., has awarded a contract to the Port Arthur Shipbuilding Company, Ltd., Port Arthur, Ont., for the installation of a new bark burner unit at its pulp mill in the Red Rock district, including boiler and auxiliary equipment. Installation is scheduled to be placed under way at early date.

Ottawa, Ont.—The Gatineau Power Company, Ottawa, furnishing power service to different pulp and paper mills in Ontario Province, is planning a 1938 expansion program for the development of additional power resources, and will begin work on project at early date. A fund of about $750,000 has been authorized for installation of additional generating equipment and extensions in transmission lines.



Keeping beater room costs under control is a job particularly suited to the Midwest. In dozens of mills, this high density beater is dumping furnishes in record time and at low cost per ton.

Compare the many advantages of this scientifically designed equipment . . . the ability to thoroughly prepare stock at consistencies up to 8% . . . the dependable performance under all conditions . . . the minimum maintenance costs . . . the attractive three year guarantee. You'll find that the Midwest is the equipment able to keep beating costs at the minimum, and by so doing, help you "cage" illusive dollars.

Find out more about the Midwest high density beater by writing the company. We will be pleased to send you full information both on new and rebuilt equipment. Midwest prices are favorable . . . Midwest workmanship will stand the closest scrutiny.

THE MIDWEST-FULTON MACHINE CO.
Dayton, Ohio

MIDWEST-FULTON

Application has been made for permission to proceed with work.

London, England—Celotex, Ltd., a subsidiary of the Celotex Corporation, 919 North Michigan avenue, Chicago, Ill., manufacturer of insulating board, wall board, etc., is completing the erection of a new mill in the vicinity of London, on which work was begun a few months ago, as previously announced in these columns, and expects to have initial units ready for operation before the close of March. New plant is being equipped for large capacity and will represent an investment of close to $1,250,000, including buildings and machinery.

A. H. Miller to Represent J. P. Lewis Co.

The J. P. Lewis Company announces the appointment of Albert H. Miller as general sales manager. Mr. Miller was formerly with Kimberly-Clark Corporation in the capacity of Eastern sales manager of their Specialty Paper Division and had been associated with that company for fourteen years.

The J. P. Lewis Company will continue to be represented in the Metropolitan area by A. R. Melker with offices at 110 East 42nd street, as they have been so ably in the past. The Company will on March 1, establish a central sales office at 654 Madison avenue, New York City, and Mr. Miller will function from that office.

It will be the purpose of the company to interest themselves in specialties, as well as continuing with converting and jobbers stock lines as heretofore.

Rubber-Lined Chlorination Towers

The two Thorne (patented) Chlorination Towers shown in photo Fig. 1 were designed by the Improved Paper Machinery Corporation of Nashua, N. H., and installed in the chlorination plant of a large paper mill where they are used for bleaching the pulp.

The towers, which are about 10 feet in diameter and 28 feet high, are lined with a 3/16-inch thickness of hard rubber. The lining is attached to the steel by means of the Goodrich Vulcalock process which gives an adhesion of over 500 pounds per square inch.

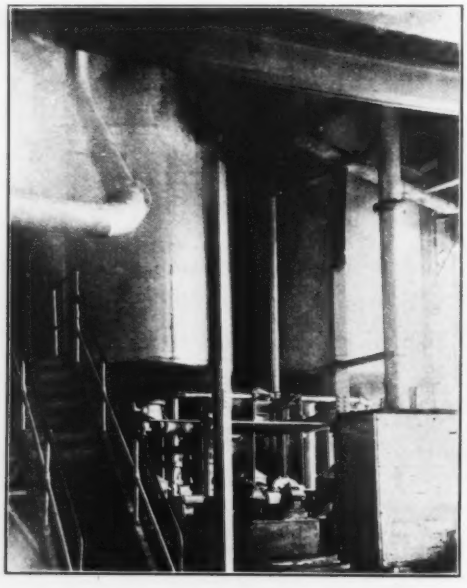


FIG. 1.

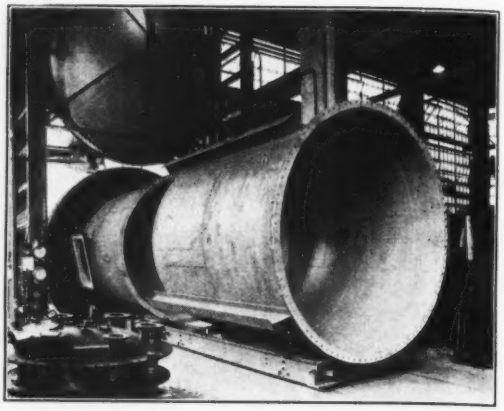


FIG. 2.

Photo Fig. 2 shows one of these rubber-lined towers being removed from a mammoth vulcanizer in the plant of the B. F. Goodrich Company. It will be noted that the tower was lined and vulcanized in two sections which were later bolted together in a vertical position. Also noticeable in this latter photo are both the horizontal and vertical expansion joints which were built into the lining as a prevention against buckling or cracking due to temperature changes.

To Manage Brown Towel Division

John H. "Jack" Leo, formerly assistant manager of the Towel Division of Brown Company, has been appointed manager of this division. He will be located at the company's offices in the Graybar Building, 420 Lexington avenue, New York City, which will become the general office for the Towel Division. The company will continue its present regional offices for towel sales in Chicago, San Francisco and Portland, Maine.

Mr. Leo is a well known figure in the trade and has a thorough knowledge of distributors' problems. He sold the first Nibroc Towels ever produced by Brown Company and has contacted towel distributors all over the country for the past 16 years.

According to Mr. Leo, Brown Company will continue its policy of "Selling through and for its distributors". He will be on hand in Rooms 980 and 982 at the Waldorf-Astoria during the convention to welcome Nibroc distributors and explain the Towel Division plans for building bigger volume and profits in 1938.

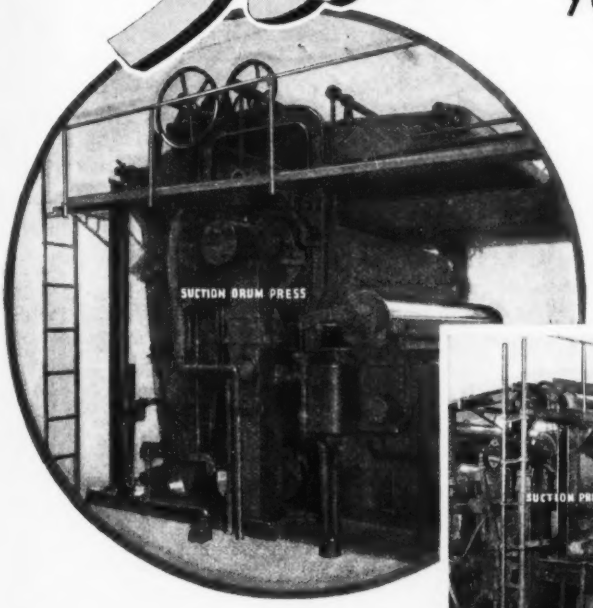
500 Tons of Wood Pulp Burn

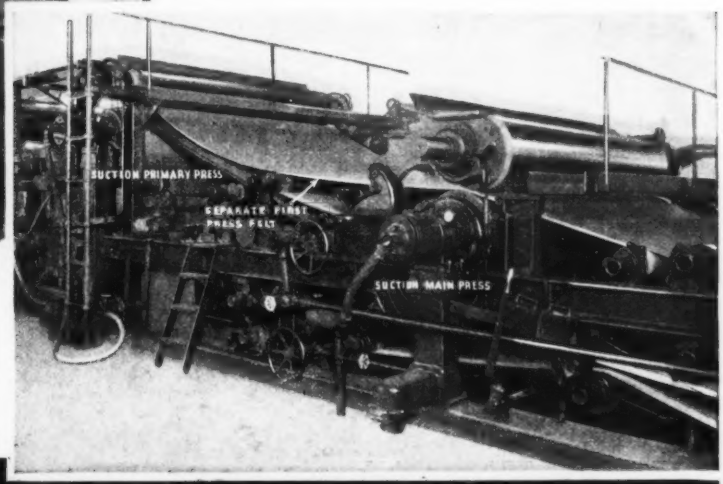
BOSTON, MASS., February 14, 1938—A stubborn fire in 500 tons of wood pulp on the Swedish freighter Dalheim at the Army Base docks Monday night, February 7, was finally brought under control after fifteen lines of hose had poured water into the hold for several hours. District Chief Charles Robertson said the fire was probably caused by a cigarette. In the two days the Dalheim had been tied up at the docks, more than half of its 1500-ton cargo had been unloaded. The rest was rushed on the wharf the night of the fire.

Suctionize

YOUR BOARD MACHINE WITH Beloit SUCTION

DRUM PRESS *
PRIMARY PRESS
MAIN PRESS





Note the short top felt for suction drum press nip. All plain primaries have been removed.

Wet pickup felt returns after suction primary press. Suction first press is on separate felt.

1. Removes large quantity water without disturbing formation or finish.
2. Reduces crushing and checking.
3. Improves finish. Reduces felt marks.
4. Permits use of light weight short top felt. Lower felt cost.
5. Eliminates several nips. Improves test of board.
6. Permits more bulk if desired.
7. Increases test or permits cheaper furnish and maintain same test.
8. Suction main press more efficient on separate felt.

* Suction drum press is equivalent to suction drum and suction primary press.

BELOIT IRON WORKS PAPER MACH'Y BELOIT WIS.

THE BELOIT WAY IS THE MODERN WAY

BELOIT IRON WORKS, BELOIT, WIS.

PAPER TRADE JOURNAL

ESTABLISHED 1872

Reg. U. S. Pat. Off.

George S. Macdonald, Pres. *Joseph P. Horgan, Secy.*
Executive and Editorial Offices, 15 West 47th St., New York, N. Y.

Henry J. Berger
EDITOR

Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

Price, Per Copy, 10 Cents — United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. CVI New York, February 17, 1938 No. 7

COMING EVENTS IN THE PAPER INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION, Sixty-first Annual Convention and meeting, Waldorf-Astoria Hotel, New York. February 21-25.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Convention, Waldorf-Astoria Hotel, New York, February 21-24. Annual Luncheon, Waldorf-Astoria Hotel, Wednesday, February 23.

SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 22.

NEW YORK ASSOCIATION OF DEALERS IN PAPER MILLS' SUPPLIES. Annual Banquet, Hotel Commodore, New York, February 23.

NATIONAL PAPER TRADE ASSOCIATION OF THE UNITED STATES, Convention, Waldorf-Astoria Hotel. New York. February 21-23.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry— Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park,American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILLS SUPERINTENDENTS ASSOCIATION. Annual meeting, Royal York Hotel, Toronto, Ont., June 22-24.

GOVERNMENT AND BUSINESS

At the conference of "small business men" held at the request of President Roosevelt in Washington two weeks ago, the opinions expressed were not very different from the frequently expressed opinions of "big business men". That the views of men engaged in both large and small business enterprises should parallel each other closely is not mere coincidence. Rather, it points out that business men are less influenced by the vision of an ideal form of government than they are concerned with practical and efficient administration in government.

The conference disclosed that, while the men engaged in the smaller business enterprises were not the rugged individualists of early years, they still were individualists and decidedly opposed to the continuance of much of the procedure which now forms so prominent a part in the Administration's plans to remedy the recession and restore prosperity to the nation.

Among the several men who voiced their convictions, was a merchant from a small town in the West who said in part: "I am convinced that the small business man does not want or need a loan nearly as much as he wants to be let alone." That is one way to state dissatisfaction with, and resentment by the business world against the many acts of the Federal Government in its various experiments to control and regulate industry and trade. There are indications that business is subjected to too much Government and the improper functions of government have undermined confidence, created uncertainty and prevented the normal expansion of industry and trade. With an abundance of private capital available and now idle, there can be no reason but fear and lack of confidence in certain acts and plans of the Administration, which prevents this private capital from being invested in the channels into which it has normally flowed to produce more and better goods and create more employment.

It is not a matter of surprise to many business men that the recommendations of the little business men were substantially the views of big business men. The suggestions of the former to remedy the current decline in business are practically the same as were embodied in the "Platform for American Industry" proposed in January by the National Association of Manufacturers and with the views of the Business Advisory Council.

The twenty-three "planks" in the platform which the little business men sent to the President may be summarized as follows:

Repeal of the undistributed surplus tax, modification of the capital gains tax and broadening the base of the income tax.

Relaxation of SEC regulations on issues of securities up to $500,000.

Legislation to make unions equally responsible with management for the fulfillment of contracts.

Investigation of administration of the Wagner Act.

Curtailment of Government expenditures and balancing of the budget, as soon as possible.

Relief administration by local communities.

More rigid enforcement and strengthening of anti-trust laws.

Reduction of unemployment insurance taxes for stabilized industries.

Confinement of Government-building activities to clearance of slums.

Principles of the Robinson-Patman and Miller-Tydings Acts, and of installment selling, were endorsed. Legislation to curb chain stores was recommended.

Government competition with private business and encouragement of consumer cooperatives were opposed.

In commenting on the recommendations of the small business men, President Roosevelt said that a

large number of the suggestions were constructive and possible of fulfillment, and a permanent advisory council of small business men to consult with the Government is to be established. Some of the recommendations were regarded as impracticable by the President. In view of his insistence of the passage of the Wages and Hours Bill, it appears that this proposed legislation is considered practicable. Because of Mr. Roosevelt's strong support of the undivided profits tax, modification rather than the repeal of this much debated measure seems more probable.

Government Paper Bids and Awards

WASHINGTON, D. C. February 16, 1938—The Government Printing Office has received the following bids for 700 sheets of light gray photo mount board: R. P. Andrews Paper Company, $6.30 per C sheets; Mathers-Lamm Paper Company, $5.00 and $5.93; Whitaker Paper Company, $5.90; George F. Muth & Co., $6.50; and Hurlock Brothers, $6.25.

WASHINGTON, D. C., February 16, 1938—Barton, Duer & Koch Paper Company has been awarded the contract for furnishing the Government Printing Office with 40,000 pounds of blue, salmon and pink, calendered tag board in 23¼ inch rolls at 7.75 cents per pound, bids for which were received on January 24.

The following awards have been announced for bids opened on January 19. The Whitaker Paper Company will furnish 10,000 sheets of 22 x 28" gray photo mount board at $35.67 per M sheets. Barton, Duer & Koch Paper Company will furnish 200,000 pounds of manila calendered tag board in 23¼ inch and 26½ inch rolls at 7 cents. Reese & Reese will furnish 5,000 pounds of rope manila paper in 48 inch rolls at 15.5 cents. Barton, Duer & Koch Paper Company will also furnish 10,285 pounds (110,000 sheets) of white sulphite writing paper, 32 x 42 inches at 7.19 cents.

The Stanford Paper Company will furnish 50,000 pounds of manila calendered tag board in 23¼ inch and 26½ inch rolls at 6.75 cents, bids for which were received on January 12.

Chlorine Institute Elects Officers

The Chlorine Institute, Inc., held its annual meeting and directors' meetings on January 28, 1938, at the Chemists' Club, New York, N. Y. The following directors were elected for 2 years: J. F. C. Hagens, Great Western Electro-Chemical Company; H. M. Hooker, Hooker Electrochemical Company; S. W. Jacobs, Niagara Alkali Company; Eben C. Speiden, Isco Chemical Division of Innis, Speiden & Co.

The hold-over directors are: N. E. Bartlett, Pennsylvania Salt Manufacturing Company; Thomas Coyle, R. & H. Chem. Dept., E. I. du Pont de Nemours & Co., Inc.; John A. Kienle, The Mathieson Alkali Works, Inc.; Louis Neuberg, Westvaco Chlorine Products Corporation; Eli Winkler, Columbia Alkali Corporation.

At a directors' meeting following the annual meeting, the officers mentioned below were selected for the year 1938:

S. W. Jacobs, president; Eben C. Speiden, vice president; Robert T. Baldwin, secretary and treasurer.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

Months	1938(c)	1937(c)	1936	1935	1934
January	63.8%	90.3%	76.1%	65.8%	.....
February	.....	90.1%	77.9%	70.0%	.....
March	.....	90.3%	76.0%	70.5%	.....
April	.....	92.1%	82.3%	70.0%	.....
May	.....	90.6%	81.6%	69.4%	.....
June	.....	87.3%	80.7%	72.3%	.....
July	.....	81.8%	77.3%	64.9%	.....
August	.....	82.9%	81.5%	70.9%	.....
September	.....	78.6%	80.5%	71.9%	58.2%
October	.....	73.5%	87.6%	75.6%	64.7%
November	.....	61.9%	88.0%	75.3%	61.7%
December	.....	54.5%	85.9%	71.2%	59.6%
Year Average	.....	80.6%	81.3%	70.5%	.....
Year to Date					
First 5 weeks	64.2%	89.9%	76.4%	65.8%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1938		CORRESPONDING WEEKS, 1937	
*January 1	47.0%	January 2	85.1%
*January 8	59.2%	January 9	92.1%
*January 15	62.3%	January 16	90.2%
*January 22	66.0%	January 23	88.9%
*January 29	68.1%	January 30	90.1%
*February 5	66.0%	February 6	88.1%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting, Current Weeks					
Ratio Limits	Jan. 1, 1938	Jan. 8, 1938	Jan. 15, 1938	Jan. 22, 1938	Jan. 29, 1938	Feb. 5, 1938
0% to 50%	201	140	127	116	104	78
51% to 100%	119	175	187	197	195	141
Total Mills Reporting	320	315	314	313	299	219

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Mos.	1937(e)	1936	1935	1934	Mos.	1937(e)	1936	1935	1934
Jan.	80%	61%	61%	....	July	67%	69%	59%	....
Feb.	86%	67%	67%	....	Aug.	74%	75%	65%	....
Mar.	87%	68%	67%	....	Sept.	70%	76%	69%	62%
Apr.	89%	70%	61%	....	Oct.	66%	82%	76%	63%
May	86%	68%	61%	....	Nov.	56%	79%	70%	56%
June	75%	68%	65%	....	Dec.	46%	74%	60%	52%

Week end. Jan. 1, 1938—24%
Week end. Jan. 8, 1938—45%
Week end. Jan. 15, 1938—52%
Week end. Jan. 22, 1938—58%
Week end. Jan. 29, 1938—60%
Week end. Feb. 5, 1938—59%

(e) Basic figures revised to include new members of the National Paperboard Assn.

Canada to Consider Log Exports

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., February 12, 1938—Alarmed at reports that Japan plans to use B. C. forests for the raw material of vast new pulp industries, the Provincial Government will bring the question of raw log exports before a national conference on forest problems in Ottawa in March.

British Columbia representatives will explain to the conference called by Ottawa that they are powerless to interfere with log exports to Japan because the logs are cut almost altogether on crown-granted areas, outside provincial control.

The Federal Government alone could affect these exports by means of an export tax or some similar measure, it is claimed.

Whether the Provincial Government will urge federal action along these lines, or whether it has already done so privately, has not been disclosed. Figures released recently showed that 27,627,709 board feet of timber was exported to Japan last year in the form of logs.

MEASURING

FIVE BILLIONTHS OF A GRAM

Speaking of "important trifles," there is no better example than those impurities in caustic soda which make so much trouble in rayon manufacture. For of all processing and manufacturing operations, rayon manufacture is probably the one in which alkali impurities get—and deserve—the most attention.

It is a significant fact, therefore, that Mathieson Caustic Soda sets the standard for purity in the rayon industry. It is equally significant that Mathieson should be the first to develop a practical method for quantitative spectrographic analysis of caustic soda.

By using spectrographic equipment, Mathieson has reduced the time required for quantitative analysis to a fraction of that previously required. Even more important, the accuracy of the results obtained has been increased to a point where impurities present in amounts as low as 1/100,000th of 1% (actually about 5 billionths of a gram) can be closely determined.

With this greater speed and increased accuracy, Mathieson is able to control the purity and uniformity of its caustic soda more closely than ever before. In addition, the company's technical and spectrographic staffs are in position to render valuable service to users of caustic in establishing their own spectrochemical laboratories and procedures.

Chemical buyers interested in knowing more of the part Mathieson has played in the development of the alkali industry will want to own a copy of "Mathieson Chemicals," a 36-page booklet outlining the company's history and describing its various products. Write for your copy today to The Mathieson Alkali Works (Inc.), 60 East 42nd Street, New York, N. Y.

Mathieson Chemicals

SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . HTH AND HTH-15 . . . AMMONIA, ANHYDROUS AND AQUA . . . PH-PLUS (FUSED ALKALI) SULPHUR CHLORIDE . . . CCH (INDUSTRIAL HYPOCHLORITE) . . . DRY ICE (CARBON DIOXIDE ICE) ANALYTICAL SODIUM CHLORITE

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Converting Starch for Tub Size*

By Edward M. Wixted[1] and Lewis G. Bassett[2]

The conversion of raw starches by means of enzymes to produce low viscosity starch dispersions for use in size tubs is attractive, because the cost of the finished material is substantially below that of the oxidized starches which are in general use. However, the paper industry is not yet fully informed as to the quality of enzyme converted starch as compared to oxidized starch. The material of this thesis is intended as a small contribution to this subject.

Raw starch is not suitable for use in a size tub, being ineffective in the uncooked state, and far too viscous if cooked in water alone. Oxidized starch on the other hand produces a very thin dispersion when boiled in water. However, if a proper quantity of a suitable enzyme is present during the cooking of raw starch a product is formed which, at the concentration desirable for tub sizing, is well within the viscosity range required. The conversion process consists in merely adding a small amount of enzyme to a suspension of raw starch in cold water, and heating the mixture, preferably with agitation, in accordance with a predetermined temperature schedule. Although the material may thicken at the gelatinizing point, it thins again in a very few minutes. The process does not require any major equipment in addition to that necessary for handling oxidized starch.

There are on the market now at least four enzymes for the conversion of raw starch, the Diastases S and C, Vanzyme, and Amyliq. The main part of the work here reported consisted of making conversions of both a typical raw corn starch, Globe Pearl, and a typical raw tapioca, Royal tapioca, with varying amounts of these four enzymes, and testing the products formed in comparison with a dispersion of an accepted oxidized starch, Hercules No. 90. The starch suspensions were subjected to tests for viscosity, reducing sugar content, and adhesive strength. The viscosity test was made because of the great importance of this characteristic in a material to be used in a size press. The sugars test serves as an indication of overconversion of a portion of the starch, and may be significant of the type of film formed by the material. The test of adhesive strength is more directly related to the results that might be expected in papers sized with the starch dispersion. It is reasonable to think that the starch with the highest adhesive strength will have the most beneficial effect on the strength of papers sized with it, as well as being most effective in bonding the fibers against pulling during a printing operation. Unfortunately the laboratory in which the work was done is not equipped to make application of starch suspension to webs of paper in a way sufficiently resembling the commercial tub sizing operation to give dependable results. Since no such actual application was made, it must be emphasized that the results here presented can only suggest what the behavior of enzyme converted starches in a paper mill may be.

The starch conversions were made in beakers with continuous mechanical agitation. Distilled water was used thruout. The ingredients were mixed at the start. The initial mixtures and the temperature schedules are given in Table I, and the temperature curves in Fig. 1. It will be seen that cooking was done either at 8 or 16 per cent concentration of air-dry starch. Immediately after conversion all the mixtures were diluted with cold water to a concentration of 4 per cent at which concentration the tests were performed.

The viscosity test was made in an Ostwald viscosimeter, the test solution being held at 135 deg. F.

* Taken from a thesis submitted in partial fulfillment of the requirements for the Ch. E. degree at Rensselaer Polytechnic Institute, June, 1937.

[1] Ch. E., Rensselaer Polytechnic Institute, June, 1937.
[2] Department of Chemistry, Rensselaer Polytechnic Institute, Troy, N. Y.

TABLE I.—CONDITIONS OF CONVERSION

Starch	Starch in Original Suspension Per cent	Amount Enzyme On Starch Per Cent	Raise to deg. F.	In (Min.)	Hold at deg. F.	For (Min.)	Raise to deg. F.	In (Min.)	Hold at deg. F.	For (Min.)
Hercules No. 90	8		212	5	212	15	...	..	...	..
Tapioca	16	0.4, 0.5, 0.6 and 0.7 Diastase S	150	5	150	15	185	3	185	5
Corn	16	0.7, 0.8, 0.9 and 1.0 Diastase C	160	5	160	30	185	3	185	5
Tapioca	8	0.7, 0.8, 0.8 and 1.0 Vanzyme	185	30	...	..	...	..	...	..
Corn	8	0.9, 1.1, 1.3 and 1.5 Vanzyme	165	5	165	15	185	3	185	5
Tapioca	8	0.5, 0.6, 0.7 and 0.8 Amyliq	212	25	212	10	...	..	...	..
Corn	8	1.0, 1.25, 1.5 and 1.6 Amyliq	212	25	212	10	...	..	...	..

by immersion of the tube in the vapor of boiling acetone. The values given are the seconds for the passage of a measured volume through the viscosimeter. Every viscosity test reported is the average of 3, the total spread between which in the highest ranges was never more than 3 seconds.

The tests for the amount of reducing sugars present in samples of converted starch were performed according to the modification of the Hagedorn and Jensen method given in the Analytical Edition of Industrial and Engineering Chemistry of September 1935 by Gore and Steele. In the present work, of course, only that section dealing with the actual determination of sugar in the presence of a large amount of starch was used. The results are expressed as per cent maltose hydrate based on the starch present. Duplicate sugar determinations were made and in no case did the two back titrations vary by more than 0.05 cc, which is equivalent, even in the starches having the least amount of sugar to an error of only 1 per cent of the quantities found.

The adhesive test was made by a specially devised method. Two one-inch strips of 24-pound substance bond paper (not surface sized) were used for each test. Small rectangles ½ x ¼ inch were cut from each side of one end of both strips thus leaving ½ inch squares projecting. These ½ inch squares were pasted together as follows. The projecting ends of the two strips were dipped for a moment into the starch solution to be tested, the solution being at 135 deg. F. The paper was withdrawn and drops of starch removed by touching the ends to the side of the beaker. One strip was laid down felt side up on a piece of glass plate and the other strip laid over it, felt side down, in such a way that only the projecting squares overlapped. The two strips then presented the appearance of a single strip notched at the center. The bond was rolled three times with a glass roller with medium pressure in order to squeeze out the excess starch, the strips removed to a dry place and

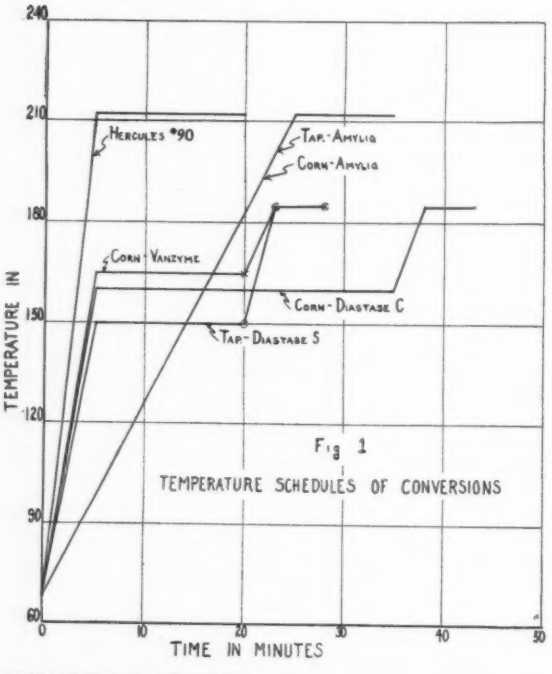


Fig 1

TEMPERATURE SCHEDULES OF CONVERSIONS

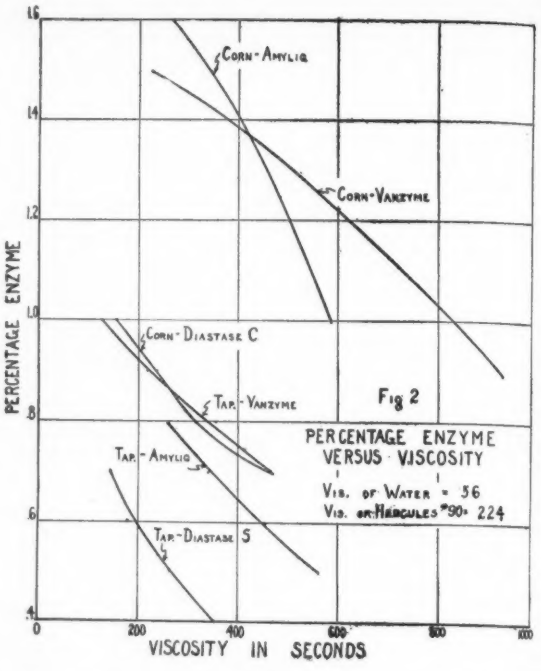


Fig 2

PERCENTAGE ENZYME VERSUS VISCOSITY

Vis. of Water = 56

Vis. of Hercules #90 = 224

allowed to dry at room temperature. The following day a tensile test of the bond was made by attaching the upper end of the pasted strip to a horizontal bar, suspending a two gallon water pail from the lower end and pouring water into the pail until the bond broke. The total pull in pounds required to break the bond is given as the adhesive strength of the starch in question. The figures given are the averages of 10 tests on each starch solution. These 10 tests are surprizingly close among themselves. The average deviation of the worst series is only 0.5 pound or, in that particular case, 5 per cent. The next largest average deviation is 0.4 pound, again 5 per cent since the film strength was proportionately less. All other average deviations were 0.25 pound or less.

The viscosities obtained by the use of various amounts of the different enzymes are shown in Table II and in Fig. 2. The viscosimeter used gave values of 56 seconds and 224 seconds for distilled water and 4 per cent Hercules No. 90, respectively, both at 135 deg. F; thus showing considerable sensitivity, since Hercules No. 90 is to all appearances water-thin. It will be seen that the viscosity is reduced by increasing the amount of enzyme used; that corn is more resistant to conversion than tapioca; and that commercially practicable viscosities may be obtained in either starch by using a sufficient quantity of enzyme.

Sugar contents of the various converted materials, expressed as maltose hydrate on the air dry starch used, are given in Table II and are plotted against viscosity as a basic characteristic in Fig. 3. Reducing materials found in the air dry starches before treatment are as follows:

Hercules No. 90.....	0.46% (As maltose hydrate)
Globe pearl corn.....	0.51% (As maltose hydrate)
Royal tapioca	0.25% (As maltose hydrate)

The sugar formed in each series of conversions increase with lowered viscosity. At the viscosity of Hercules No. 90, the tapioca-Amyliq conversion contains sugar only slightly in excess of that in the

oxydized starch, with the others showing larger amounts up to the corn-Vanzyme conversion with over twice the content of the oxydized starch.

The adhesive strengths of the various converted materials are given in Table II and are plotted against

TABLE II.—TESTS ON CONVERTED MATERIALS

Starch	Emzyme on Air Dry Starch Per cent		Relative Viscosity in Seconds	Maltose Hydrate on Air Dry Starch Per cent	Adhesive Strength in Pounds
Hercules No. 90.....	.....		224	1.46	10.1
Globe Pearl Corn....	.7	Diastase C	478	1.88	10.0
	.8	Diastase C	316	2.55	9.4
	.9	Diastase C	238	3.19	8.4
	1.0	Diastase C	156	3.57	7.1
Globe Pearl Corn....	.9	Vanzyme	931	2.24	10.2
	1.1	Vanzyme	716	2.66	11.8
	1.3	Vanzyme	521	3.21	13.3
	1.5	Vanzyme	223	3.58	15.9
Globe Pearl Corn....	1.0	Amyliq	584	1.52	10.8
	1.25	Amyliq	478	1.92	11.5
	1.5	Amyliq	341	2.26	12.6
	1.6	Amyliq	265	2.36	13.0
Royal Tapioca.....	.4	Diastase S	356	2.43	8.8
	.5	Diastase S	269	3.09	8.2
	.6	Diastase S	183	3.46	7.6
	.7	Diastase S	147	3.65	7.1
Royal Tapioca.....	.7	Vanzyme	466	1.77	1.4
	.8	Vanzyme	358	2.00	1.6
	.9	Vanzyme	220	2.20	1.9
	1.0	Vanzyme	127	2.47	2.4
Royal Tapioca..	.5	Amyliq	563	1.41	13.8
	.6	Amyliq	456	1.54	14.7
	.7	Amyliq	342	1.58	14.7
	.8	Amyliq	262	1.60	14.9

viscosity in Fig. 4. The strength of the Amyliq- and Vanzyme-converted starches increases with lowered viscosity; that of the diastase-converted starches decreases. No explanation of this difference in behavior can be offered, particularly since it occurs in the same viscosity range. At the viscosity of Hercules No. 90 a very wide spread in strength is seen, the tapioca-Vanzyme conversion being 0.2 as strong as the oxydized starch; the corn-Vanzyme conversion being almost 1.6 times as strong.

Just a little work was done on the effect of pH of the water used for conversion. Tapioca was converted with 0.7 per cent Amyliq in waters which before the addition of the materials ranged from pH 6.6 to 9.2, adjustment being made with alum or sodium hydroxide. The distilled water used in the main

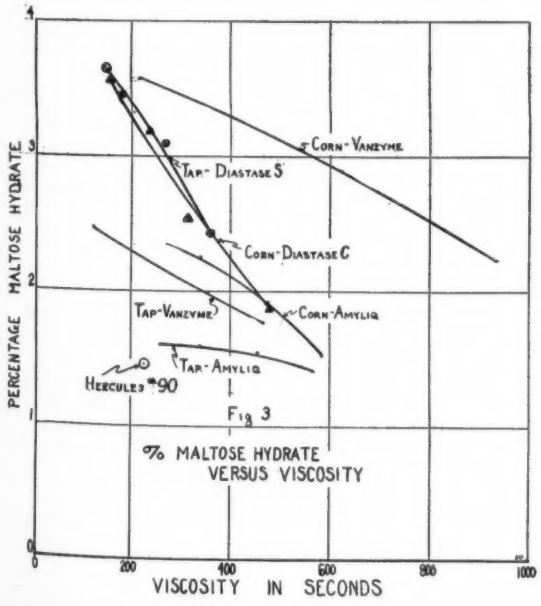


Fig 3
% MALTOSE HYDRATE VERSUS VISCOSITY

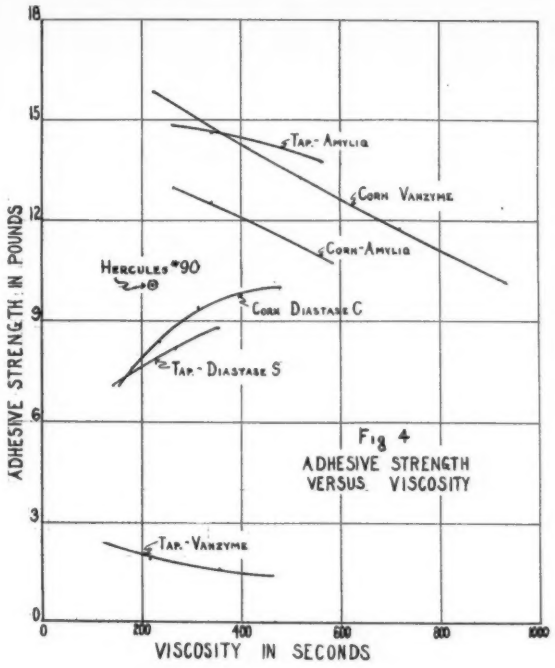


Fig 4
ADHESIVE STRENGTH VERSUS VISCOSITY

body of the work was at pH 6.9. No difficulty was met in the pH range mentioned, there being a slight reduction in the viscosity of the converted material as the pH of the water used rose. In an attempt to determine whether materials which might be encountered in mill waters would affect conversion, a water containing 0.6 p.p.m. chlorine, 0.6 p.p.m. ammonium sulphate and 2 p.p.m. alum (hydrated), was used for a tapioca-0.7 per cent Amyliq conversion. No loss of efficiency was noted.

The work which has been presented, although interesting, is admittedly limited in scope. A great deal of time could well have been spent on investigations of other temperature curves, of starches from other sources, on pH and oxidation-reduction potentials, and, in particular, on the application of the converted starches to paper followed by an appraisal of the effects.

Starters Protected Against Explosion

For refineries, chemical plants, paper mills, and plants where corrosive or explosive gases may be present, the newly issued pamphlet, "Five Point Protection Against Explosion and Corrosion with Westinghouse De-Ion Oil Immersed Motor Starters," will be of special interest.

The booklet illustrates the protection features of these starters. A table includes the range of sizes and combinations which are available to meet exact requirements.

Where corrosive conditions exist without explosion hazards a modification of this design is available at lower cost. For application where circuit protection is otherwise provided there are combination starters with non-automatic motor circuit switches; also plain starters without disconnecting means.

These pamphlets may be secured from the nearest district office of the Westinghouse Electric and Manufacturing Company, or from headquarters at East Pittsburgh, Pa.

Driers in the Paper Industry

By Ogden Minton[1]

One of the major parts of a pulp, paper, or board machine is the drier. It is much the largest and heaviest part of the machine. Much thought and attention has been given to it by designers, builders and users. Various articles have been written about driers of one type or another but most of these articles have dealt largely with details of design and have not considered the subject from its broader aspects. The object of this article is to consider the subject from a broad standpoint and will omit all details of design.

After all is said and done a drier is just a large water evaporator. There are many driers in daily use that evaporate considerably over 300 tons of water per day. This is no small accomplishment and the size of the operation alone makes it of sufficient importance to warrant giving it considerable attention. Drying as practiced in the pulp and paper industry is not as simple a problem as it appears. It was not so many years ago that there was little attention given to such things as vapor pressure, heat recovery, and evaporating temperatures. A stack of open driers, partially or not at all hooded, was considered to be good enough and its chief requirement was to dry the product. Its effect on the product was little appreciated and little serious consideration was given to it. Today things are quite different. Paper makers are now commencing to demand much more than heretofore. The temperature at which the product is dried has taken on significance. Efficiency is demanded.

There is not space now for the writer to go into all the very interesting engineering features in connection with drying, that have been solved and put into practice in recent years. He does, however, want to clarify the situation from the broad aspect of general design. Many new types of driers have come on the market, all of which have some merit. Any purchaser very naturally wants his drier to include all the good features and no bad feature; however it is impossible to have Utopia and therefore the designer makes compromises of one kind or another, hoping to end up with the best possible design for any given particular purpose.

Three Types of Driers

Broadly speaking there are three types of driers in commercial use in the Pulp and Paper Industry from which the purchaser must make a selection. After the purchaser has made his selection of a type of drier, the designer then can go ahead with his design and work out details of design that will improve the operation, reduce the size or cost of the drier, or increase its efficiency. The scope of this article stops with the selection of the type of drier that the purchaser may select. However, before the purchaser makes his selection of any type of drier he has to know what each type is capable of doing and the results that he can obtain from that particular type of drier.

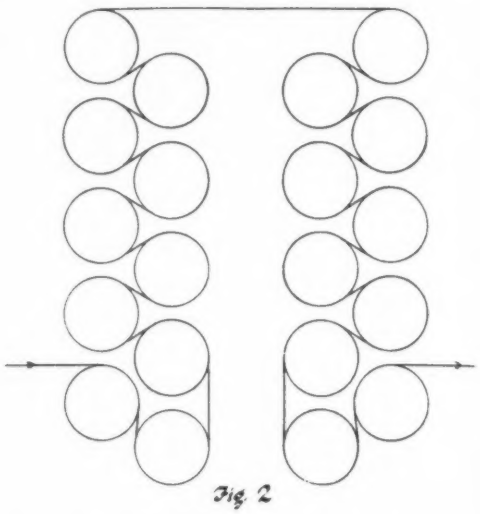


Fig. 2

(1) A Bank of Open Driers.

These can be one high, two high, or made vertical in which case they may be almost any number high. They may or may not be equipped with drier felts. In all modern machines they are equipped with a tight fitting hood and an economizer to recover heat. They must be equipped with fans to pass air between and around the bank of driers to take away the water vapor. The quantity and temperature of the air has to be given careful consideration. Within certain limits the quantity of air will largely determine the temperature of evaporation and also the capacity of the drying operation. The efficiency will fall off with any increase in air quantity. The power for fans will increase with the use of additional air. Also if the product is to be kept clean the air should be filtered and preferably conditioned. This is an expensive thing to do. The above illustrates only some of the decisions the purchaser is immediately faced with. See Figs. 1 and 2.

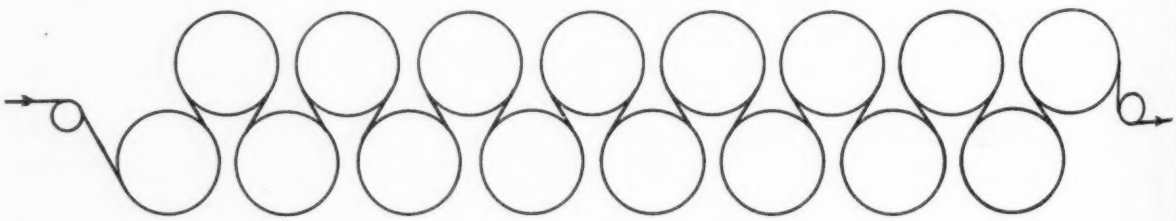


Fig. 1

[1] Member TAPPI, President, Minton Dryer Corporation, Greenwich, Conn.

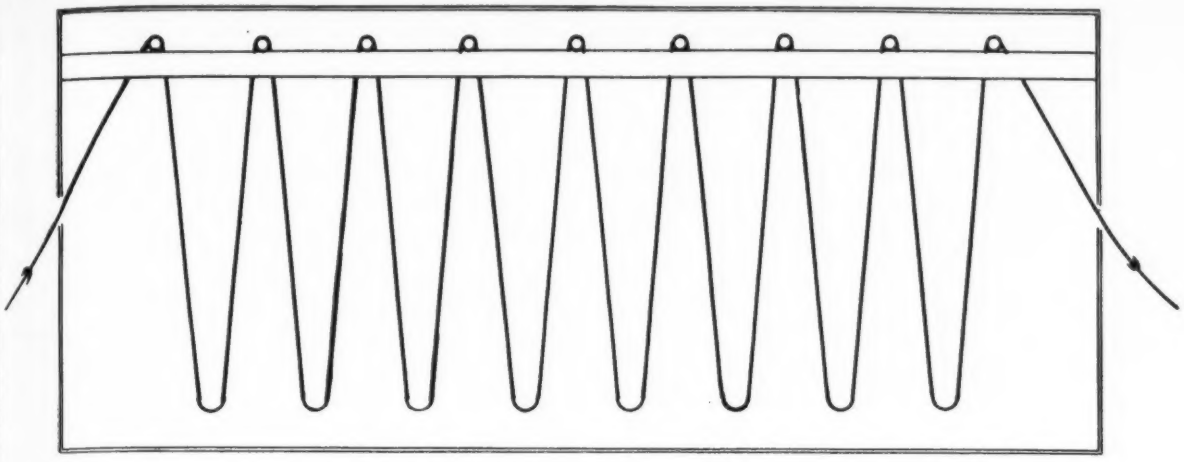


Fig. 3

(2) An Air Drier.

In this case the product is lead through a chamber in close proximity to but not in contact with steam heated coils or radiators. In principle it is much like an open drier except for the fact that in the open drier, the product is in close and intimate contact with drier cylinders which are filled with steam and heat passes directly to the product without having to pass through air as an additional conducting medium for the heat. Air also must be used to remove the water vapor. This, on modern air driers, is often done in stages and heat exchangers are used to save heat from one stage for reheating air in the next stage. Air driers can be made in several different designs. The product can be passed through the chamber on poles and hung in loops. This is called a pole drier (sometimes a festoon drier). See Fig. 3. The product can be led through the chamber horizontally on wires or on poles and several passes made from the front to the back end of the machine. See Fig. 4. The product can be led vertically around rolls and several passes made to obtain sufficient drying capacity. See Fig. 5. A more complicated air handling problem exists than in the use of an open bank of driers but the same thermodynamic problem is present and the same need for a selection of just the best amount of air and the need of having the air clean. It is very important that the reader appreciate the great similarity of the open bank of driers and any air drier from a thermodynamic and engineering standpoint.

(3) A Vacuum Drier.

This is a comparatively new design of drier. It comprises a chamber in which is placed a small bank of driers. These driers are in every particular just like open driers. They are usually equipped with felts but are not necessarily so equipped. The chamber has an ingoing and an outgoing seal through which the product to be dried can pass into and out of the chamber but through which air can not pass. No air is admitted during the drying process. To the chamber there is connected a condenser to condense the water vapor and a vacuum pump is used to evacuate the air and to maintain a vacuum of 28 inches of Mercury during the drying operation. This so lowers the vapor pressure that the water in the product evaporates at 100°F which is a very low drying temperature. The cylinders are filled with steam just as in an open bank of driers. A very large temperature differential exists between the steam temperature and the drying temperature which makes it possible to reduce the number of drying cylinders necessary for any given capacity. In practice a vacuum drier requires half as many drying cylinders as are required in a bank of open driers. Hence the drier is half as long. High vacuum is necessary to obtain the above results. In the case of the vacuum drier the designer is faced with making a design strong enough to withstand the external pressure of the air. Little or no air has to be handled nor does any air have to be

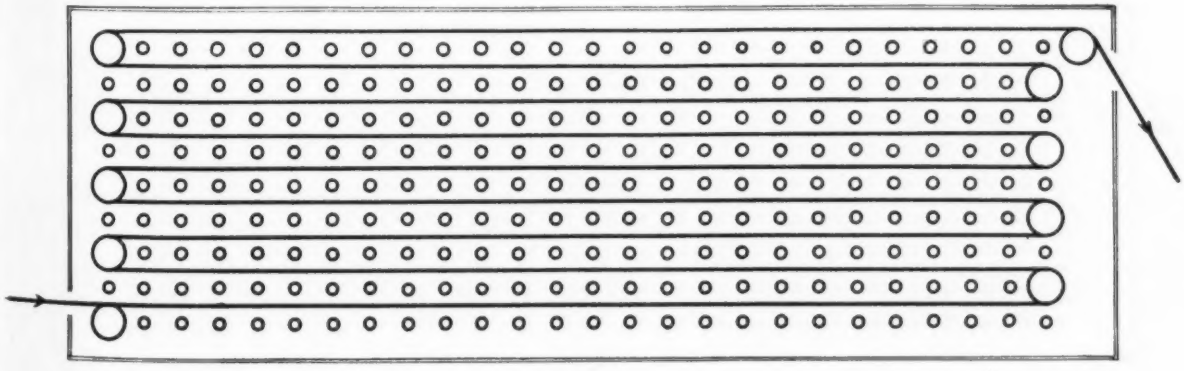


Fig. 4

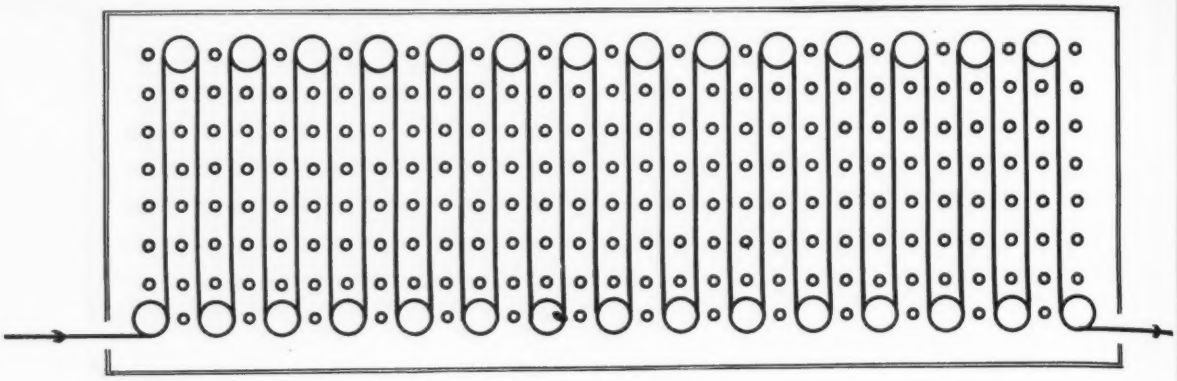


Fig. 5

cleaned. Uniform drying conditions always exist as the vacuum drier makes its own atmospheric conditions. It operates independently of outdoor conditions. See Fig. 6.

From the above it should be noted that the vacuum drier differs from both the air drier and the open bank of driers in that it does not use air to carry away the water vapors formed due to evaporation. This is the fundamental difference. Neither the air dryer, the open bank of driers, nor the vacuum drier resemble one another to look at, but actually the only fundamental technical difference of importance is the use of air in all but the vacuum drier to carry away the water vapor.

Drier Specifications

Before selecting any type of drier the purchaser should list the requirements of the dryer he intends to purchase. The designer must know the capacity desired. He must know how wet the product is going to be coming to the drier and how dry it must be leaving the drier. Below is given a list of things the purchaser must very carefully consider before he selects any type of drier:—

(1) *Size.* All other things being equal the smallest drier is more desirable.

(2) *Cost.* All other things being equal the cheapest drier is the more desirable but it must be well enough built to stand up under pulp and paper mill operation.

(3) *Maintenance.* Low maintenance is very desirable.

(4) *Operation.* Ease of operation is important. The pulp or paper should be easy to pass through the drier without lost time and there should be freedom from breaks in the web.

(5) *Speed.* Consideration must be given to the possibility of speeding up the drier at some later date when increased capacity is desired and the drier should be so built that it is easily possible to add additional units to increase its capacity.

(6) *Quality of Product Produced.* This is of the utmost importance. The strength and color of the product must not be injured in the drying process. Pulp must be so dried that it will beat easily and also lay flat and bale easily. Cockled pulp is never desirable. There are many such considerations.

(7) *Dirt.* It is very essential that the drier does not put dirt of any kind on the product.

(8) *Working Conditions.* Any improvement in working conditions in the machine room is also desirable.

(9) *Adaptability.* It is desirable to have a drier that

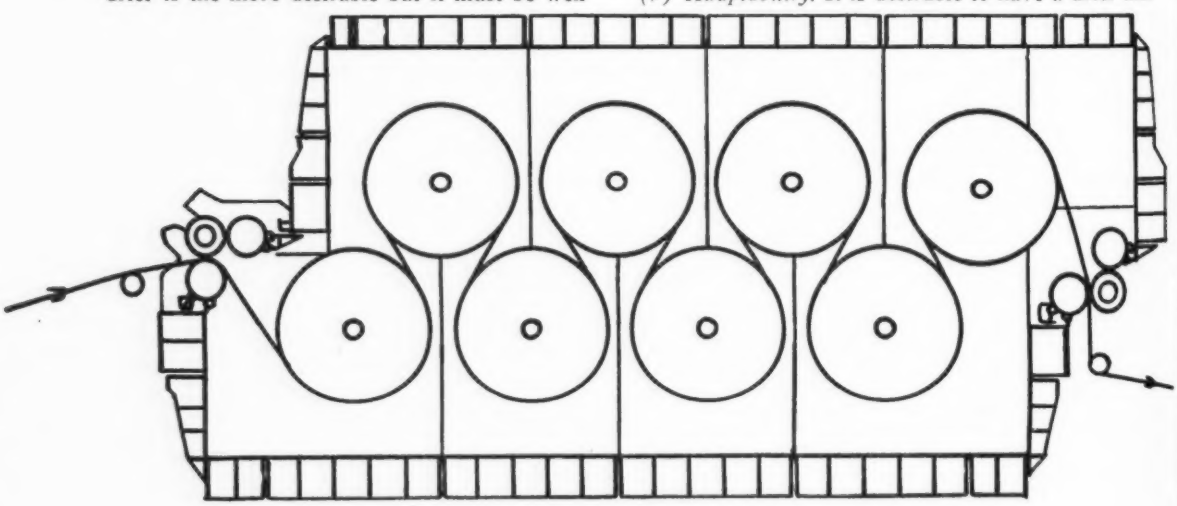


Fig. 6

is adaptable to dry more than one kind of product.

(10) Efficiency. The more efficient a drier is the better it is and the less it costs to make the product.

(11) Power Required. Any saving in power is desirable.

Only after giving full consideration to all of the above enumerated items as well as others not listed is the purchaser able to make an intelligent selection of one of the three types of driers; namely a bank of open driers, an air drier or a vacuum drier. For any certain specified purpose one of these types must be better than the others. Surely the only rational way of coming to a correct solution is to compare the ability of the three different types of driers to meet the qualifications set forth above, or other qualifications that may occur to the reader.

Comparison of Drier Types

Many claims have been made for each of these three systems of drying. There is much confusion in the minds of many people regarding the merits of one or the other of them. Drying on open banks of driers is a very old process as also is air drying in one form or another. The vacuum drier is, comparatively speaking, new. Many improvements have been made in connection with drying on all three of these types of driers. They are now all well made machines and include many refinements not found in machines built even ten years ago.

Most of the following conclusions are facts that can be easily verified by the reader. They are as follows:—

(1) Size. For any given capacity (tons per 24 hours) the open bank of driers and the air drier are about equal in size while the vacuum drier is just about one half as large.

(2) Cost. The open bank of driers is usually the lowest in cost with the air dryer only a very little more expensive. The vacuum drier is more expensive. However, when due credit is given the vacuum drier for savings in floor space, hence building cost, there is little difference in the installed cost between any of the three types of driers.

(3) Maintenance. The maintenance cost of the vacuum drier is about 7 cents per ton higher than the maintenance cost of a bank of open driers of the same capacity but this is many times over made up for in the saving in cost of steam. The maintenance cost of a modern air drier is not known to the writer.

(4) Operation. Pulp, paper or board passes automatically through a vacuum drier and breaks rarely occur. Open banks of driers are equipped with automatic feeders that work successfully and breaks are not a serious consideration. Air driers usually require hand feeding. Lost time due to operation appears to be about even with any of the three types of driers.

(5) Speed. The speed of air driers is distinctly limited whereas the drier or the open drier is capable of operating at any speed that the rest of the machine can be operated at.

(6) Quality of Product. Because of the low temperature of vacuum drying and because of the absence of air during the drying operation there is little or no oxidation of the fibers and the product is brighter in color and stronger. The drying process simply evaporates the water and does not in any other way affect the product. Air drying, if large quantities of low temperature air are used, does much the same thing but to keep down the size of air driers they almost without exception use high temperature air which injures the strength and color of the product dried. Because of the extremely low temperature in vacuum drying it is impossible to make rosin sized paper as the temperature is not sufficient to flux or sinter the rosin. By means of an additional drying process using solvent sizing the vacuum dryer can make super-sized papers and color it all in one operation, and add much to the strength and color value. This adds to the capital cost.

Air drying is suitable for only a few grades of paper as the paper not being held on a smooth surface cockles and only seldom, in some special high grades of paper, is this desirable. The temperature at which pulp is dried in air driers is high enough to cause a loss of both strength and color value because it fluxes or sinters any natural resins in the pulp, thus partially sizing it and making it more difficult to beat. Also, air dried pulp is cockled and more difficult to bale.

The open bank of driers operates at high temperature and has the disadvantages of the air dryer in this respect but it operates at just about the correct temperature to make rosin sized paper of excellent quality. It makes paper without cockles.

Much can be written on the subject of quality but space does not permit.

(7) Dirt. Here the vacuum drier has a definite advantage over any other type of drier as there is no air passed over the product during the operation. All open banks of driers and air driers use a very large amount of air and unless this air is filtered and conditioned it just must carry dirt onto the product being dried and worse still, it leaves this dirt on the surface of the sheet where it is very easily seen. For instance pulp may be made very clean and actually have a very low dirt count in its make-up, but a small amount of dirt on the surface is all counted by the customer and this small amount will make the total assumed dirt appear very high.

(8) Working Conditions. So far as working conditions are concerned the vacuum drier is far superior to either the air drier or the open bank of driers. There is very little heat radiated from the Drier, as the temperature of the vapor inside the case is only 100°F. There is no water vapor set free in the machine room and only sufficient ventilation has to be supplied to take care of the wet end of the machine. As the machine is half as long it is easier to tend.

(9) Adaptability. The air drier is adaptable only to dry products in which cockling is desired. The open bank of driers and the vacuum drier are adaptable for drying products where flatness is desirable. Both the latter can be used for pulp, board or paper. At low or high speed. The vacuum drier is limited to making products not requiring rosin sizing unless

using an additional unit to Solvent Size. The same Open or Vacuum Drier could be used for drying pulp or newsprint. The Air Drier can not be used for making newsprint. Many other things will occur to the reader.

(10) *Efficiency.* Here the vacuum drier excels. From its very nature it must be efficient. The driers being surrounded by a high vacuum are almost perfectly insulated and give off heat only to the product being dried which is in actual intimate contact with them. Vacuum driers operate at a thermal efficiency of about 96 per cent, and not only that, but they return to the mill all the heat used in drying in the form of hot water for use wherever desirable. They require only 1.18 pounds of steam to evaporate 1 pound of water. The best air driers require at least 1.25 pounds of steam to evaporate 1 pound of water and a good open drier well hooded and equipped with economizers requires about 1.75 pounds of steam to evaporate 1 pound of water. The vacuum drier and the open bank of driers use exhaust steam, or can be designed to, whereas the air drier requires high pressure steam or else it becomes too large in size.

(11) *Power Required.* There is not much difference in the power requirements of either of the three types of driers. The vacuum drier requires power for the vacuum pump but this is offset by power required in the other two types of driers for fans for air ventilation.

If an impartial study of the above conclusions is made the following facts will be apparent:—

(1) That the vacuum drier can not make rosin sized paper without an extra operation of solvent sizing. This adds to the capital cost. If solvent sizing is used then the vacuum drier is able to produce super quality not only rosin sized paper but paper sized with many other synthetic resins.

(2) That the vacuum drier is the best type of drier for drying pulp, blotting paper, newsprint and all other unsized paper.

(3) That the open bank of driers is best adapted to make flat rosin sized paper.

(4) That the air drier is best adapted to make cockled rosin sized paper and is the only drier to be had for this purpose.

(5) One fundamental difference is apparent, namely that the vacuum drier has a very low drying temperature in comparison to either an open bank of driers or an air drier.

(6) Another fundamental difference is that only the vacuum drier eliminates the use of air to carry away the water vapors formed during the drying operation thus eliminating the dust and dirt from going into the product being dried.

After the purchaser has made his selection of a type of drier he then should consider various details of construction of the type of drier he has selected as well as the construction of his machine room in order that the drier fit properly in the machine room. Any of the types of driers can be made long and low or high and short. Any of the types of driers can be built cheaper or more costly depending on the specification as to bearings, balancing of rolls, etc The purchaser must keep in mind the fact that the drier is going to dry his product for many years to come and that additional capital cost may pay for itself many times over if such additional cost will give him a machine that will stand up under the hard continuous use that all such machines get in pulp, paper or board mill use, and give steady continuous operation without forced shut-downs for repairs. Only too often does it happen that the saving in original cost can be shown later to be a very expensive expedient.

The purchaser should further consider the builder's ability to build a first-class machine. The builder he selects should have a reputation for making high quality machinery and experience in so doing, and be in such financial condition that it is certain that he will be able to fulfill any contract he assumes. Only if the purchaser gives consideration to all of the above things can he have assurance that the drier he buys will turn out to be a successful drier in all respects.

In making his selection of the type of drier he is going to buy, the purchaser must carefully consider all the claims made for each type of drier, as only too often claims are made that do not prove to be facts. Guarantees often are worthless as they are invariably so drawn that they leave many loopholes and it is much safer to buy from an established builder of good reputation with no guarantee than from some other less well known builder with a full guarantee.

It is a known fact that pulp, paper and board mills go into great detail and very exact specifications when they buy a boiler and demand the last bit of efficiency from the boiler but do they carefully and properly analyze their drying problem? Do they select the right type of drier and see that it is properly equipped? Do they insist on high efficiency in the drier to the same extent they do in a boiler? Only too often the purchaser of a drier never knows whether or not it is efficient and rarely does he show enough interest in it to have a test made to show what it is accomplishing. Yet this same purchaser is very careful indeed in the purchase of a boiler and insists that it pass a very definite test. If this were done in the case of driers many mill executives would be shocked at the results. Steam costs are figured down to decimal parts of a cent, yet mill officials will waste many cents per ton in cost of water evaporated from pulp, board or paper and use this carefully valued steam to do the work of evaporation, and will not even inquire about the performance of the drier. Keep in mind the fact that a big drier is called upon in many cases to evaporate 300 tons of water per day and this in itself takes a fair sized boiler to supply the steam. Why worry about the cost of steam unless you are going to worry about how efficiently that steam is used?

With the technical knowledge now available in all modern mills it is time that the officials make a study of their drying problems. It is entirely possible in some cases to calculate costs to the extent that present drying equipment will be found too expensive to operate and that it will pay to scrap it and install modern efficient drying equipment in its place, despite the large capital outlay necessary.

All of the above is offered for the serious consideration of the technical men in the mills and the mill officials. It is the duty of the technical men to bring such conditions to the attention of the mill officials and it is their duty to see that modern and efficient driers are installed to replace inefficient equipment when and if it exists.

Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson and Clarence J. West, Chairman of the Committee.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Machinery

Replacing the Litharge-glycerol Cement as Used in Sulphite Pulp Production. D. I. Sychev. Bumazhnaya Prom. 15, No. 12: 40-44 (Dec., 1936); C. A. 31:3262.—Of the various luting or cementing compounds here compared (used in bonding the linings of sulphite pulp digesters) the best results were obtained with a mixture consisting of equal parts of kaolin and quartz and containing 5 per cent casein on the weight of sodium silicate used as a binder.—C.J.W.

Aprons. Pappen- Holzstoff-Ztg. 44 (in Kartonnagen-Papierwaren-Ztg. 41), No. 10: 114-5 (March 5, 1937); B. I. P. C. 7:303.—Fourdrinier machines with modern high pressure stock inlets no longer require aprons: by far the larger part of paper machines, however, are still equipped with them. Rubber aprons are superior to the older leather aprons; they are uniform in thickness, are not affected by temperature and moisture, and are not so liable to warp. The chief requisite of a good apron is that it lies perfectly flat. Aprons made from oilcloth have recently been placed on the market; they are, however, not as resistant to wear as rubber aprons.—C.J.W.

Damaging of Woolen Felt Cloth in the Manufacture of Paper. Klepzig's Textile-Z. 40:131-134 (1937); C. A. 31:3270.—The cloth used for the conductance of the fiber pulp through the presses and the drying drums and consisting of pure wool, cotton or asbestos or mixtures of these materials is often prematurely damaged. Among the hazards are excessively strong felting, unnecessarily high temperature and alkalinity, incomplete washing of the alkali used in the felting operation, destruction caused by insects during storage, action of sunlight (light-damage wool will swell more than unaffected wool if treated with 0.1 N sodium hydroxide), washing of dirty felt with alkaline "special washing agents", acid damage, and bacterial action. The various hazards are discussed, and the damage caused by them is shown in a number of illustrations.—C.J.W.

Optimum Screen Vibration in the Production of Fine Grades of Rag Paper and the Influence of Screen Vibration on the Transparency of Condenser Paper. I. V. Kramarev. Tsentral. Nauch.-Issledovatel. Inst. Bumazh. Prom., Materialy 1936, No. 1: 102-112; C. A. 31:3267.—The effect of the frequency and amplitude of screen vibration on the quality of rag paper and specific properties of condenser, cigaret and transfer papers was studied. The tabulated results show that with increasing frequency of the screen-table vibration the breaking length increases, porosity and air permeability decreases and transparency improves. At amplitude of 9-10 mm. and higher no increase of breaking length or improvement of other constants takes place. At lower amplitudes under all conditions of experimentation, the properties of paper improved. Vibration of 260-280 per minute and 5-7 mm. amplitude are considered as optimum conditions.—C.J.W.

Method of Attaining Improved Felting of the Fibers in Pulp on the Wet Part of Paper and Board Machines. Sigbjörn P. H. E. Holgerson and William A. E. Tibell. U. S. pat. 2,076,991 (April 13, 1937).—A high-frequency (at least 1000 per min.) vibration is imparted to the roll preferably by means of alternating current vibrators. The rolls of the shake section are constructed with a fixed core and a rotatable shell. [Cl. 92-45].—A.P.-C.

Paper Machine. Lloyd D. Smiley, assignor to The Smiley Industrial Filter Co. U. S. pat. 2,073,654 (March 16, 1937).—The stock is fed to a bottomless box-like structure mounted over an endless wire which passes around two spaced horizontal rolls, one of which is at a somewhat higher level than the other, so that the wire enters the pool of stock at the lower roll and leaves it a short distance before reaching the high roll. Suction boxes are provided under the upper reach of the wire. The machine may be modified to act as a washer or as a save-all. [Cl. 92-39].—A.P.-C.

Device for Observing the Operation of Press Rolls. Oscar Rolls. U. S. pat. 2,076,095 (April 6, 1937).—A water collecting vessel is arranged below a paper machine press and is divided into a number of independent sections each receiving the water from that portion of the press immediately above. An apparatus for measuring the quantity of water collected in unit time is associated with each section of the vessel. [Cl. 92-49].—A.P.-C.

Core-end for Paper-winding Cores. James A. Taylor. U. S. pat. 2,076,870 (April 13, 1937).—The core is constructed of a number of windings of paper, glued and compressed into a compact, stiff tube. In each end of the core there is inserted a metal sleeve provided with a keyway that interlocks with the key in the shaft on which the core is mounted and by which it is secured when paper is being wound or unwound. [Cl. 242-68].—A.P.-C.

Automatic Break-off Mechanism. Harold E. Pierce, assignor to Marathon Paper Mills Co. U. S. pat. 2,074,237 (March 16, 1937).—The emergency appliance is so mounted and operated that a release in the tension of the paper web due to breakage serves to actuate a breaker arm which strikes upon the paper web immediately in advance of the delivery roll, thereby instantly breaking the paper web and concurrently setting brake mechanism upon the delivery roll, which stops its rotation and prevents any further delivery of paper. [Cl. 91-44].—A.P.-C.

Core Crimping Machine. Archibalt G. Adams and Joseph Bertain, assignors to International Paper Co. U. S. pat. 2,056,380 (Oct. 6, 1936).—A number of radially disposed inner and outer jaws are so constructed that a uniform crimping pressure takes place through the entire surface of the end of the core, thereby preventing the formation of fractures and weakened spots. The inner and outer jaws are operated by the same impelling mechanism from which force is transmitted through a rigidly aligned head so that pressure at every part of the core will be evenly and simultaneously supplied.—A.P.-C.

Disintegrating Paper Making Material. Marcel Lamort, assignor to E. et M. Lamort Fils. U. S. pat. 2,076,899 (April 13, 1937).—The invention consists essentially in the combination of rotating means or stirring wheels revolving in a chamber having its walls at least partially provided with openings of convenient size. The rotating means disintegrate the material which passes through the openings as soon as it is reduced to a small enough size. The displacement of the wheels adjacent the walls generates pulsations which prevent clogging of the openings; this action may be increased by providing the inner surface of the walls with ribs. Means are provided for extracting foreign materials by mounting at one end of the chamber a door that normally remains closed, but is opened under the pressure of foreign bodies. [Cl. 92-20].—A.P.-C.

Rope Guard for Paper Making Machines. Russell Carpenter. U. S. pat. 2,074,045 (March 16, 1937).—The invention provides guards and deflectors to prevent displacement of the ropes due to accumulation of wads of paper in the device covered by Carpenter's U. S. pat. 1,660,917, of Feb. 28, 1928. The guards are constructed so as to completely enclose the ropes so that it is impossible for wads or other accumulations of broken paper to engage the ropes at or immediately in advance of the points of entry of the ropes into the drier-roll grooves. [Cl. 34-48].—A.P.-C.

Fourdrinier Paper Machines. Maurice O. Nielson. Brit. pat. 456,280 (Nov. 5, 1936).—A fourdrinier paper machine slice held in brackets on side walls of the pond and vertically adjustable as by screws with locking-nuts, etc., has a separate, tapered strip of rubber, thin metal, etc., received in a channel of a bronze casting extending along the slice and housing plungers held to the strip by studs to allow local, vertical adjustment by screws with hand-wheels.—A.P.-C.

Device for Delivering Stock on the Paper Machine Wire. J. M. Voith & Co. Fr. pat. 808,140 (July 16, 1936).—The stock inlets is fixed, and the breast roll and a portion of the table roll section are adjustable both vertically and horizontally.—A.P.-C.

Spots on Paper Machine Wires. M. Marini. Papier 40: 143-153 (Feb., 1937).—A general discussion of the nature, causes and removal of various types of spots that form on paper machine wires.—A.P.-C.

A New Standard of Speed Control for Variable Speed Paper Machine Turbines. E. L. Richardson and R. P. Rynders. Paper Trade J. 104: No. 16: 35-36 (April 22, 1937).—A discussion of the operation, performance and merits of the new electrically-driven governor developed by the General Electric Co., and consisting essentially of a standard fly-ball-type governor positively coupled with the turbine by means of a synchronous electric transmission.—A.P.-C.

Some Important Considerations in the Design of Electrical Machinery for Paper Mills. J. L. Rylander and M. R. Lory. Paper Trade J. 104, No. 15: 51-56 (April 15, 1937).—A discussion of some of the electrical design problems which arise in making machines for paper mill applications. The special operating conditions encountered in paper mills which endanger the life of electrical machines are given and some of the measures taken by the designer to protect against these conditions are described. A few illustrative examples of the application of electrical machines to typical paper mill drives are given.—A.P.-C.

The Oil-Paper Relationship in the Printability of Paper. G. L. Larocque. Pulp Paper Mag. Can. 38: 77-84 (1937).—A method has been developed, and is described, for determining the magnitude of the capillary pressure causing the natural penetration of oil into paper and for determining the mean effective radius of the capillary pores. Oil absorption measurements with three different oils showed that the penetration is proportional to the quotient Surface-Tension Viscosity of the oil employed, and supported the contention that absorption takes place in accordance with the known laws that govern the capillary flow of liquids into porous bodies. The variation in absorption time with temperature depends solely on changes in oil viscosity. Increase in atmospheric relative humidity results in a marked and irreversible decrease in the magnitude of the oil absorption. A new apparatus and technic are described for measuring a hitherto undetermined printing property of paper, viz., the oil absorptiveness of the paper surface. Comparison of this test with oil flotation measurements showed that the latter depend on the penetration of an excess of oil through the sheet and are not a measure of the absorptiveness of the paper surface for printing oil.—A.P.-C.

Chemistry of Synthetic Surface Coatings

Chemistry of Synthetic Coatings by William Krumbar, vice president in charge of Technical Development, Beck, Koller & Co., Inc., Detroit, Mich., and formerly director of the Institute of Paint and Varnish Research, Berlin, Germany, in a 200 page cloth pound volume of interest to paper manufacturers and coaters.

The main chapters are 1. Chemical Reactions in the Varnish Kettle; 2. Drier Chemistry; 3. Surface Chemistry of Pigments and Paints; 4. Physical Chemistry of Surface Coatings; and 5. Synthetic Resins in Printing Inks. Chapters 4 and 5 are of particular interest to the paper industry.

In reference to synthetic resins, printing methods are reported for newspaper, letterpress, high speed magazine color, rotogravure and lithographic ink. The fundamentals of drying by penetration, evaporation, oxidation and gelatins are considered.

The appendix contains a classification of synthetic resins and data on mixtures of resins with nitrocellulose lacquers.

Although the book is essentially for paint and varnish makers the development of new inks and coatings in the paper and graphic arts industries command this book to printers, paper makers and coaters. It may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry at $4 per copy.

Delaware Valley TAPPI Discusses Printing

The Delaware Valley Section of the Technical Association of the Pulp and Paper Industry met at the Engineers Club, Philadelphia, Pa., Friday evening, February 11. James d'A Clark presided as chairman.

Byron L. Wehmhoff Speaks

The Speaker was Byron L. Wehmhoff of the West Virginia Pulp and Paper Company who talked on the subject "Testing the Printing Qualities of Paper."

Mr. Wehmhoff pointed out that paper must be considered as a raw material for printers who are primarily interested in paper uniformity and printing qualities, especially for multi-color printing. Because of these needs there is a growing tendency to have specifications for paper. The paper industry can do much to avoid consumer specifications by studying the printers needs and establishing suitable manufacturers specifications. At present the U. S. Government laboratories, the Lithographic Technical Foundation and some private companies are doing most of the research work.

Most Important Factors

The three most important factors regarding paper for printing are formation, ink receptivity and surface smoothness. The paper must be strong enough to run mechanically and have a surface that will resist picking.

Ink receptivity is measured by the absorption of ink (using oil soluble dyes as indicators) and the oil absorption test. The greater number of printing jobs aside from newsprint required by oxidation rather than by penetration. The simple water absorption test has some (but limited) bearing on the measure of ink receptivity, since it indicates degree of sizing and the materials used in sizing, up to a certain extent, have ink receptivity properties themselves.

The smoothness of the sheet or uniformity of the surface can be measured by any one of three commonly used porosity methods.

Surface strength is measured by the Dennison sealing wax test or by the Bakk tester (the latter is good for research but slow for routine testing).

The ink should be as tacky as the paper will allow. If it is too tacky the machine can be slowed until the tackiness of the ink can be improved. Tack may be considered as ink stickiness and is best measured by feel. Ink length refers to flowability and consistency refers to ink body. The moisture of the sheet and humidity in the press room have influence on these properties and printing results.

Increase in paper strength usually reduces printing qualities of paper. Ink receptivity increases with sizing up to a certain point, usually about two per cent.

Those in Attendance

Those present included: Vladimir Karapetoff, Cornell University, Ithaca, N. Y.; E. H. Davis, International Printing Ink Corporation, New York, N. Y.; J. R. Roberts, C. E. Johnson & Co.; James d'A. Clark, Scott Paper Company, Chester, Pa.; B. L. Wehmhoff, West Virginia Pulp and Paper Company, Covington, W. Va.; Miss R. M. Cobb, Lowe Paper Company; Ridgefield, N. J.; A. M. Cooper, Westinghouse Electric and Manufacturing Company; Philadelphia, Pa.; J. M. Tuttle, Glassine Paper Company, Conshohocken, Pa.; George Heidrich, Wallace & Tiernan Company; Philadelphia; E. A. Shallcross, Philadelphia; C. W. Rivise, Caesar & Rivise, Philadelphia; Leslie Justice, Valley Forge Laboratories, W. Conshohocken, Pa.; Harry Hulmes, Moore & White Company, Philadelphia; Mack Kendall, Mazer Paper Company, Lansdowne, Pa.; Dr. Engel, Mazer Paper Company, Lansdowne, Pa.; A. Schnabel, Mazer Paper Co., Lansdowne, Pa.; G. L. Schwartz, Dupont Experimental Station, Wilmington, Del.; R. F. Nelson, Glassine Paper Company, W. Conshohocken, Pa.; R. M. Bates, Thos. M. Royal & Co., Philadelphia; E. N. Leonard, same company; W. E. Brow, Container Corporation of America, Manayunk; B. R. Havens, same company; C. M. Connor, Valley Forge Laboratories, W. Conshohocken; R. W. K. Ulm and J. C. Shaw, Container Corporation of America, Manayunk; A. L. M. Bixler, Riegel Paper Corporation, Riegelsville, Pa.; W. D. Harrison, same company; F. W. Varden, Barber Company, Philadelphia; H. L. Becher, Homasote Co., Trenton, N. J.; E. H. Koontz, Reliance Electric and Engineering Company, Philadelphia; R. J. Stuart, Messinger Bearings Inc., Philadelphia; G. F. Hom, same company; W. M. Lee, Thos. M. Royal Company, Philadelphia; F. J. McAndrews, McDowell's Paper Mills, Manayunk; C. Le Grande Smith, W. H. & L. D. Betz, Philadelphia; M. Craig Maxwell, McDowell's Paper Mills, Manayunk; R. G. Macdonald, Secretary of TAPPI, New York, N. Y.; K. G. Bierlich, Beach & Arthur Paper Company, Paperville, Pa.; Wesley Wilkinson, Beach & Arthur Paper Company, Coatesville, Pa.; V. Jacobsen, National Aniline and Chemical Company; Philadelphia; S. F. Goodheart, Fred H. Levey Company, Philadelphia; C. F. Chiappe, same company; J. F. Halladay, Container Corporation of America, Manayunk; J. P. Field, same company; Ralph Mair, Krebs Pigment & Color Corporation, Newark, N. J.; Elliot Stokes, Stein Hall & Co., Philadelphia; John Garcke, same company; R. H. Dellin, same company, J. J. Lofferty, same company; Jacob Edge, Downingtown Manufacturing Company, Downingtown, Pa., C. W. Hoffman, Riegel Paper Corporation, Milford, N. J.; C. E. Peterson, same company, Riegelsville, N. J.; J. Carl Schmidt, Dupont Company, Philadelphia; Arthur Link, Bulkley, Dunton Company, New York, N. Y.; H. F. Mahaley, P. H. Glatfelter Company, Spring Grove, Pa.; R. Tutt Jr., Peter Cooper Corporation, Philadelphia; A. J. Luettgen, P. H. Glatfelter Company, Spring Grove, Pa.; R. W. Ball, Krebs Pigment and Color Corporation, Newport, Del., C. M. Dann, same company; G. B. Martin, General Dyestuff Company, Philadelphia; C. A. Shubert, Dill & Collins Inc., Philadelphia; H. F. Hoffman, General Dyestuff Corporation, Philadelphia; W. R. Willets, Titanium Pigment Corporation, New York; Samuel Clayman, Clinton Company, Clinton, Iowa; E. J. Albert, Thwing Albert Instrument Company, Philadelphia; J. D. Davis, Dill & Collins Inc., Philadelphia; John Roslund, Moore & White Paper Company, Philadelphia; E. N. Glauner, Downingtown Manufacturing Company, Downingtown, Pa.; J. J. McDonald, Brown Company, New York, N. Y.

Lake States TAPPI Discusses Wood Measurement

The February meeting of the Lake States Section of the Technical Association of the Pulp and Paper Industry was held at the Conway Hotel in Appleton Wis., on the evening of February 8, 1938. The program consisted of a series of talks on wood measurement and wood decay.

Mark W. Bray of the Forest Products Laboratory at Madison, Wis., presented a paper titled "Decay of Pulpwood and Woodpulp in Storage." Mr. Bray reviewed the work in this field that has been done at the Forest Products Laboratory over a number of years and pointed out its relation and importance to the normal procedures for storing wood pulp and pulpwood.

Wood Measurement

Mr. J. V. Martin of The Munising Paper Company discussed the evaluation of pulpwood for the purpose of determining more accurately the actual amount of wood contained in the normal screened cord. He described work which has been carried out to determine the weight of oven-dry wood per cord by two procedures; namely, by weighing and determining moisture content, and by determining volume and oven-dry weight per cubic foot. Following the procedure he used, he obtained very close checks by the two methods and concluded that these evaluations could be made with sufficient accuracy and at a cost which made them practical for obtaining a more accurate evaluation of wood.

Mr. Robert Rogers of the Kimberly-Clark Corporation discussed the use of weighometers in checking wood use and inventories. The less desirable aspects of other systems of measurement such as the cunit (100 cubic feet of solid wood) and the wood ton were presented, as well as the desirable aspects of evaluating wood for purchase, for mill statistics, and shipments of wood in cars.

Those in attendance were as follows: Francis Alland, Hoberg Paper Mills; E. P. Arpin, Jr., F. A. Leavens & Co., Neenah; H. P. Baldwin, Consolidated Water Power and Paper Company; Mark W. Bray, Forest Products Laboratory; E. B. Brookbank and M. A. Buchanan, The Institute of Paper Chemistry; W. H. Burns, Valley Iron Works Company; C. J. Christiansen, Nekoosa Foundry and Machine Company; Walter C. Christensen, Hoberg Paper Mills; James B. Clarke, National Aniline and Chemical Company; Glenn Carroll, Combined Locks Paper Company; W. D. Conway and Edward E. DenDooven, Hoberg Paper Mills; Robt. I. Dick, Valley Iron Works Company; J. Frank Doubleday, Wadhams Oil Company; M. L. Downs, Thilmany Pulp and Paper Company; Roger Egan, Bulkley Dunton & Co.; Arthur F. Eisenach, Hoberg Paper Mills.

W. H. Falatick, Thilmany Pulp and Paper Company; Wm. H. Gaedke, Badger Paper Mills; F. R. Goddard, Nekoosa-Edwards Paper Company; John H. Graff, The Institute of Paper Chemistry; J. W. Grimes, Standard Oil Company; M. C. Heyer, Hasco Valve and Machine Company; E. B. Hurst, Consolidated Water Power and Paper Company; I. H. Isenberg, The Institute of Paper Chemistry; Hans John, Kimberly-Clark Corporation; Charles Johnson, The Institute of Paper Chemistry; W. A. Johnson, Hoberg Paper Mills; C. H. Keepers, Nekoosa-Edwards Paper Company; M. J. Ketter, Hoberg Paper Mills; F. G. Kilp, Nekoosa-Edwards Paper Company.

Albert E. Kissel and Irvin J. Klika, Hoberg Paper Mills; R. G. Knechtges, Northern Paper Mills; Charles M. Koon, The Institute of Paper Chemistry; R. J. LeRoux, Interlake Pulp and Paper Company; F. R. Lillie, Crane Company; N. L. Malcove, Northern Paper Mills; Jos. Marchant, Hoberg Paper Mills; J. V. Martin, Munising Paper Company; W. M. McGraw, General Electric Company; James McIntyre, The Institute of Paper Chemistry, C. G. McLaren, Tomahawk Kraft Paper Company; P. K. McNaughton, Northern Paper Mills; C. R. Morse, Wisconsin River Paper and Pulp Company; H. E. Nelson, Nekoosa-Edwards Paper Company; R. A. Nugent, C. C. Parvin, and T. A. Pascoe, Nekoosa-Edwards Paper Company; A. Phillips, Interlake Pulp and Paper Company; W. B. Pusey, Valley Iron Works Company; Jos. H. Quell, Interlake Pulp and Paper Company; J. B. Roskams and Howard Sheldon, Hoberg Paper Mills; J. A. Staidl, Thilmany Pulp and Paper Company; Edwin Timmerman, Northern Paper Mills; J. A. Van den Akker, The Institute of Paper Chemistry; Wm. Verhagen and Ervin J. Vickman, Hoberg Paper Mills; Rex Vincent, Bulkley Dunton & Co.; C. J. Wassenberg, Interlake Pulp and Paper Company; James E. Watson, Wisconsin Wire Works; J. Preston Weidner, The Institute of Paper Chemistry; Paul H. West, Thilmany Pulp and Paper Company; N. F. Wilmot, Mathieson Alkali Works; Harold Woehler, Fox River Paper Company; J. Carl Wollwage and Howard W. Morgan, The Institute of Paper Chemistry.

Barnes Belts for the Paper Industry

The Henry K. Barnes Company, of 17 Battery March Street, Boston, Mass., after considerable experience in the New England States among paper mills now offer a belting for the difficult drives in the pulp and paper mills.

This company, founded in 1876, purchase both domestic and foreign steer hides, from which they tan and produce many types of leather specialties.

Special tanned belting such as Chrome, Gambier and Combination Tan and Oak are tanned and manufactured by employees who have been with this one company for many, many years. In fact, the president of the company, Walter M. Ray, who started with the company in 1898 as an office boy at $3.00 a week, follows in his present capacity, Charles A. Choate, Charles A. Rideout and Arthur D. Hitchings, all of whom pursued the original policies of Mr. Barnes laid down by him when he started the company as a youth of 29.

Ably assisting Mr. Ray today are Charles A. Hardy, who, prior to his assuming the position of treasurer and sales manager, was widely known in the textile field and E. Harry Landberg, assistant treasurer and secretary.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING FEBRUARY 12, 1938

SUMMARY

Cigarette paper .....2 cs.
Wall paper .....5 cs.
Paper hangings .....6 bls., 2 cs.
Filter paper .....30 bls., 11 cs.
Drawing paper .....14 cs.
Surface baryta coated paper .....17 cs.
Colored paper .....2 cs.
Photo paper .....6 cs. (unsensitized)
Tracing cloth .....11 cs.
Tissue paper .....56 cs.
Envelopes .....11 ctns.
Miscellaneous paper .....10 cs.

CIGARETTE PAPER

De Mauduit Paper Corp., *Ile de France,* Havre, 2 cs.

WALL PAPER

Titan Shipping Co., *Stavangerfjord,* Oslo, 5 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Farmer,* London, 2 cs. 5 bls.
P. C. Kuyper, *Bremen,* Bremen, 1 ble.

FILTER PAPER

E. Fougera & Co., *Queen Mary,* Southampton, 30 bls.
H. Reeve Angel & Co., Inc., *American Farmer,* London, 11 cs.

DRAWING PAPER

Japan Paper Co., *American Farmer,* London, 2 cs.
H. Reeve Angel & Co., Inc., *American Farmer,* London, 8 cs.
Devoe & Raynolds Co., *American Farmer,* London, 4 cs.

SURFACE BARYTA COATED PAPER

L. A. Consmiller, *Bremen,* Bremen, 17 cs.

COLORED PAPER

D. C. Andrews & Co., *Bremen,* Bremen, 2 cs.

PHOTO PAPER

J. J. Gavin & Co., *Queen Mary,* Southampton, 6 cs. (unsensitized)

TRACING CLOTH

C. Bruning & Co., Inc., *Bremen,* Bremen, 11 cs.

TISSUE PAPER

——, *Keisho Maru,* Kobe, 56 cs.

ENVELOPES

Reiser & Co., *American Farmer,* London, 11 ctns.

MISCELLANEOUS PAPER

Ensign Manfg. Co., *Keisho Maru,* Yokohama, 7 cs.
T. N. Fairbanks Co., Inc., *Kano Maru,* Yokohama, 3 cs.

RAGS, BAGGINGS, ETC.

Banco Coml. Italiane Trust Co., *Keisho Maru,* Kobe, 59 bls. rags.
J. Levy & Son, *Orizaba,* Havana, 19 bls. rags.
Bank of Athens, *Executive,* Piraeus, 22 bls. rags.
——, *Pres. Pierce,* Bombay, 80 bls. rags.
I. Eisenberg & Son, *Seatrain Havana,* Havana, 208 bls. rags.
Hoffman Lion Mills, *Skjelbred,* Kobe, 130 bls. rags.
Royal Manfg. Co., *Skjelbred,* Kobe, 107 bls. rags.
Hughes Fawcett, Inc., *Skjelbred,* Kobe, 10 bls. flax waste.
Chase National Bank, *Kusnets,* Leningrad, 2736 bls. rags, 176 bls. flax waste.
Banco Coml. Italiane Trust Co., *Kusnets,* Leningrad, 113 bls. rags.
——, *R. Maersk,* London, 33 bls. rags, 9 bls. waste threads.
A. H. Searle, *R Maersk,* London, 47 bls. rags.
E. Butterworth & Co., Inc., *R. Maersk,* London, 66 bls. old strings
——, *Nankai Maru,* Kobe, 25 bls. rags.

BONE GLUE

——, *Saturnia,* Trieste, 300 bags.

OLD ROPE

W. Steck & Co., *R. Maersk,* London, 224 coils.
——, *R. Maersk,* London, 62 coils.
Banco Coml. Italiane Trust Co., *R. Maersk,* London, 63 coils.

WOOD PULP

——, *Stavangerfjord,* Drammen 125 bls. sulphite.
Irving Trust Co., *Stavangerfjord* Oslo 250 bls. chemical pulp.
Absorbo Beer Pad Co., *Saturnia,* Trieste, 331 bls. wood pulp.
Gottesman & Co., Inc., *Scanmail,* Iggesund, 2000 bls. sulphate.

PORTLAND IMPORTS

WEEK ENDING FEBRUARY 12, 1938

Gottesman & Co., Inc., *Kexholm,* Sweden, 1381 bls. sulphate.
Price & Pierce Ltd., *Hallaren,* ——, 3000 bls. unbleached sulphate.
Price & Pierce, Ltd., *Hallaren,* ——, 2604 bls. unbleached sulphite.

BOSTON IMPORTS

WEEK ENDING FEBRUARY 12, 1938

Gottesman & Co., Inc., *Kexholm,* Sweden, 525 bls. unbleached sulphite.
Pagel Horton & Co., Inc., *Hallaren,* Sweden, 1750 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING FEBRUARY 12, 1938

Chase National Bank, *Skjelbred,* Kobe, 40 bls. rags.
Continental Bank Trust Co., *Black Condor,* Antwerp 69 bls. rags.
Gottesman & Co., Inc., *Sagoporack,* Sweden, 2000 bls., bleached sulphite.
Gottesman & Co., Inc., *Sagoporack,* Sweden, 2000 bls. unbleached sulphite.

BALTIMORE IMPORTS

WEEK ENDING FEBRUARY 12, 1938

M. Sone, *City of Havre,* Hamburg, 498 bls. wood pulp.
M. Sone, *City of Baltimore,* Hamburg, 498 bls. wood pulp.

NEW ORLEANS IMPORTS

WEEK ENDING FEBRUARY 12, 1938

M. Sone, *Kentucky,* Sundsvall, 3000 bls. wood pulp.

HOUSTON IMPORTS

WEEK ENDING FEBRUARY 12, 1938

Lone Star Bag & Bagging Co., *Skjelbred,* Osaka, 590 bls. bagging.

A Brand New Method of Training

At a private showing, last Friday, February 4, before a dozen leaders of industry, a new Foreman's Conference Service, based upon a series of talking still pictures that dramatize plant and personnel problems and show methods of solving them, was demonstrated at the offices of MacVeagh & Co., 630 Fifth avenue, New York.

This foremen's service applies for the first time to the training of foremen the technique that has been used successfully by numerous manufacturers for the training of salesmen. This technique is the use of talking pictures that visualize and dramatize the every-day problems encountered by foremen in every type of industrial plant. The films show how these problems can be met and overcome in such a way that human relations and cooperation within the plant will be improved. In effect, the service "gives the foreman the same break as the salesman." The pictures are designed to be shown at foremen's conferences where they will initiate discussions and inspire suggestions for increasing the efficiency of all employees through effective leadership.

A typical film is the one discussing the figures and facts of the balance sheet—analyzing in terms of the average man's personal experience just what is meant by the terms used in the balance sheet. The framework for this explanation is provided by a foreman, Dave, who consults with his company's auditor in an effort to set himself straight, so that in turn the men in his department may know and understand.

Worthington Acquires Interest in Moore

Worthington Pump and Machinery Corporation of Harrison, N. J., has recently announced the acquisition of an interest in the Moore Steam Turbine Corporation of Wellsville, New York. This association adds to the list of products sponsored by Worthington an extensive line of steam turbine equipment and in turn provides Moore with the benefit of Worthington's resources in matters pertaining both to application and metallurgy.

In the formal announcement of this acquisition, C. E. Searle, vice president of Worthington, stated, "It is the determination of both Moore and Worthington to continue the steady progress of development which has characterized the policy of Moore Steam Turbine Corporation throughout its existence. The fine reputation which Moore products enjoy in many industries, including the Petroleum, Chemical, Public Utility and Shipbuilding, is based upon a standard of quality which will be maintained."

New Creation by Hurlbut Paper Co.

Audubon Deckled Edge is an entirely new creation in fine paper making just announced by the Hurlbut Paper Company, of South Lee, Mass. A beautiful printing surface, brightness of color, opacity, bulk and feathery colored deckled edges woven right into the edges of the sheet itself, make Audubon Deckled Edge one of the most attractive and unique text and cover papers ever produced.

N.A.W.M.D Will Entertain Ladies

The National Association of Waste Material Dealers, Inc., recently announced from its executive headquarters in New York that in recognition of the fact that it is celebrating this year its Twenty-fifth Anniversary, special arrangements are to be made to entertain the wives and daughters of members who may attend the Convention, which is to be held at the Hotel Astor, New York, March 14th to 16th inclusive.

Heretofore no arrangements for such entertainment have been made but this year plans have been made to see that all visiting ladies are entertained while in the city.

All of the convention arrangements are in the hands of committees, one being a convention committee, headed by Carlton B. Overton; another, the Banquet Committee, headed by E. J. Keller, and a third, a committee representing the New York N.A.W.M.D. Luncheon Club headed by Louis Marcovitz, which committee will have charge of any convention features sponsored directly by that club.

Never before in the history of the association have reservations, both hotel and banquet, come in in such large numbers at such an early date as this year, which convinces those in charge of arrangements that the attendance at the Twenty-fifth Anniversary Convention will be double that of any previous convention and will bring to New York a larger group of waste material dealers than has ever been assembled at any one place in the past.

Those planning to attend the Convention will receive full information by addressing the Secretary, Chas. M. Haskins, Association headquarters, 1109 Times Building, New York City.

Paper Maker's Directory of Sweden

The present 1937-1938 edition of the "Paper and Pulp Makers' Directory of Sweden, Norway, Denmark and Finland", containing 328 pages, is the fourteenth. Edited by Hugo Brusewitz Aktiebolag, with the technical cooperation of the prominent men in the paper and pulp industry of these countries, the volume's form of compilation remains unchanged.

The mills located in each of the various four countries are outlined regarding owners, capital, officers, location, shipping port, annual production, and the year the mill was erected.

At the end of each country-section, there are given the associations and unions of mills, established for different purposes in each country. Where, however, an association includes more than one country, its listing is found at the end of the Swedish section.

The book, costing Swedish Kr. 15.90 postfree, may be purchased directly from Hugo Brusewitz Aktiebolag, Gothenburg, Sweden.

Badger Mills Earns $3.61 Per Share

[FROM OUR REGULAR CORRESPONDENT]

PESHTIGO, Wis., February 14, 1938.—Badger Paper Mills, Inc., last week reported net income of $269,366 during 1937, as compared with $167,301 during 1936. The earnings are equal to $3.61 per common share after deduction of preferred dividends. The company paid out $217,791 in dividends during 1937, E. A. Meyer, president, told the stockholders.

J. Andersen & Co.

Selling Agents

21 East 40th Street

New York

CHEMICAL & MECHANICAL PULP

Kraft Pulp

BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
KALIX TRÄINDUSTRI AKTIEBOLAG
Vanaförden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
NENSJÖ CELLULOSA A.-B.
Sprängsviken, Sweden

Bleached Sulphite

KELLNER-PARTINGTON PAPER PULP CO., LTD.
Sarpsborg, Norway
Edsvalla, Sweden
Hallein & Villach, Austria

Unbleached Sulphite

AKTIESELSKABET GREAKER CELLULOSEFABRIK
Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bratislava, Czecho-Slovakia
SVANÖ AKTIEBOLAG
Svanö, Sweden

West Virginia Pulp and Paper Company

230 Park Ave.
New York

35 East Wacker Drive
Chicago

503 Market St., San Francisco, Cal.
Public Ledger Building, Philadelphia, Pa.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

• • • •

KRAFT WRAPPING AND KRAFT ENVELOPE.
KRAFT CYLINDER BOARD.
BLEACHED SULPHITE AND SODA PULP.
BLEACHED AND UNBLEACHED KRAFT PULP.

MILLS:

Mechanicsville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina.

Knox Felts

EXCELSIOR — Knox Woolen Co. — Camden, Me. — FELTS & JACKETS

HIGH POROSITY

. . . as a characteristic of a paper maker's felt will, not only add to the life of felt, but saves time lost on the machine due to excessive shut downs for washing. Specify

EXCELSIOR FELTS

and minimize this trouble. Made by the Knox Woolen Co., of Camden, Maine, since 1864.

BULKLEY, DUNTON & CO.

295 Madison Ave. New York, N. Y.

CAledonia-5 5260-68

ENGLISH ECCO CLAYS

ECCO CLAYS — TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, February 16, 1938.

The pick-up in demand which resulted in an improvement in the wholesale paper market several weeks ago continues. Sales volume in most grades of paper is reported as light and a large part of the business being done is on a hand-to-mouth basis. Inventories in practically all lines are so low and prices are so generally well maintained that the market is in a stabilized and healthy condition. The book paper division, where heavy buying for the future before the price rise last Spring piled up relatively heavy stocks, is now getting back to a more normal level. Prices of all grades of paper continue firm and unchanged for the current week.

Newsprint continues active and contract orders are moving in normal volume.

The demand for writing paper is somewhat improved and sales volume in fine papers continues rather light. A slight improvement in tissues has created more optimism in this division of the paper trade.

The demand for kraft paper, which declined sharply at the close of last year, has greatly improved and a gradual increase in volume is expected in the trade.

The box board market is slightly less active for the week. Prices of several grades of board are lower.

Chemical Pulp

The chemical pulp market continues on about the low level of the preceding week. No change in demand or prices are reported.

Mechanical Pulp

The mechanical pulp market continues quiet. Prices are unchanged and conform to prevailing quotations.

Old Rope and Bagging

The old rope market is quiet and very little business is reported in old bagging. Prices are relatively firm and no changes are reported for the week.

Rags

The demand for domestic rags continues very light. Prices of new and old rags are unchanged, with the exception of new white No. 1 shirt cuttings and new No. 1 silesias, which are lower this week. The foreign rag market is inactive. Prices are nominal.

Waste Paper

Little activity is reported in the waste paper market. Prices continue to conform to prevailing quotations, with the exception of the price of white envelope cuttings which is lower for the current week.

Twine

The twine market reports demand as rather light. Prices are unchanged and, in general, are firm.

Inter-Society Color Council to Meet

The Inter-Society Color Council of which the Technical Association of the Pulp and Paper Industry is a member, will hold its annual meeting on Thursday, February 24, 1938, at the Electrical Testing Laboratories, 80th street and East End avenue, New York. Any member of TAPPI wishing to attend will be welcome.

The business session will be held at 9:30 A. M., at which time reports of officers and committees will be heard. There will be a luncheon at 1:00 P. M.

At 2:00 P. M. the technical session will convene to consider the following papers:

"History of the Design of the Spectrophotometer,' by A. C. Hardy, Massachusetts Institute of Technology.

"Construction of the Spectrophotometer," by J. L. Michaelson, General Electric Company.

"Calibration and Operation of the Spectrophotometer," by K. S. Gibson, National Bureau of Standards.

"Application of Spectrophotometric Data to the Printing Industry," by Carl Foss, Interchemical Corporation.

"Identification of Gelatins for Theatrical Lighting," by D. B. Judd, National Bureau of Standards.

Supper will be served at 6:30 P. M., following which a popular program will be presented as follows:

"Psychology of Color," by Forrest L. Dimmick, Hobart College.

"Color in Interior Design," by Ethel Lewis, Associate Editor, Interior Design and Decorating.

"Solar Corona, Painting and Description," by Charles Bittinger, Artist, Washington, D. C.

"Colored Motion Pictures of the Growing of Crystals under Polarized Light," by Lloyd A. Jones, Eastman Kodak Company.

Whiting-Plover To Continue Unchanged

Two rumors have been plaguing the paper industry: (1) Whiting-Plover Paper Company, Stevens Point, Wis., is going to consolidate with Fox River Paper Company, Appleton.

(2) Whiting-Plover is being sold to Zellerbach Paper Company, San Francisco. Fact is that the company will continue to be operated by the Whiting Estate, which owns all the stock, with Frank B. Whiting, son of the founder, as president.

Mundt

Perforated Screens
For Pulp and Paper Mills

Steel, Copper, Brass
Bronze, Monel Metal
and Other Alloys
Punched for Centrifugal
and Rotary Screens,
Pulp Washers, Drainer
Bottoms, Filter Plates, etc.

Charles Mundt & Sons
63 Fairmount Ave. Jersey City, N. J.

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time

DRAPER BROS. COMPANY

CANTON, MASS.

Woolen manufacturers since 1856

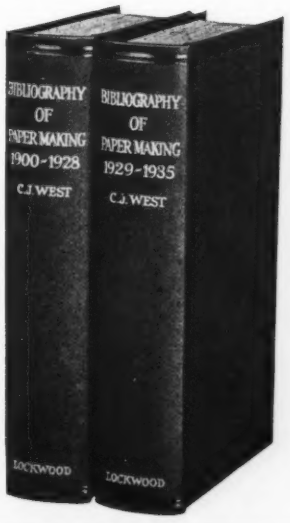
LOCKWOOD BOOKS

BIBLIOGRAPHY OF PAPERMAKING

By Clarence J. West

	PRICE
Volume 1—1900-1928	$10.00
Volume 2—1929-1935	8.00
Paper Making Materials C. J. West	3.00
Chemistry of the Sulphite Process	3.00
Total Value	$24.00

These Four Volumes
for only $20.00



LOCKWOOD TRADE JOURNAL CO., Inc.

15 West 47th Street • New York, N. Y. • U. S. A.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, February 16, 1938.

BLANC FIXE—The prices of blanc fixe are reported as firm and unchanged from prevailing quotations. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is quoted at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—The price of bleaching powder is firm and quotations conform to prevailing prices. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is reported as moderate. Prices are fractionally lower for the week. Domestic standard ground casein is quoted at from 9¾ to 10¼ cents per pound; domestic finely ground at 10½ cents per pound; all in bags, car lot quantities.

CAUSTIC SODA—Prices of caustic soda continue firm and unchanged from prevailing quotations. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market reports prices as firm and unchanged from prevailing quotations. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is quoted at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—The chlorine market reports prices as firm and conforming with prevailing quotations. Chlorine is quoted at $2.15 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market reports prices as firm, with only slight reductions for the current week. "G" gum rosin is quoted at $5.65; wood rosin at $5.50 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.95 per 100 pounds, f.o.b., shipping point.

SALT CAKE—The salt cake market reports prices as firm and unchanged from prevailing quotations. Prices range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—The prices of soda ash are reported as firm and unchanged for the current week. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The corn starch market is reported as firm. Prices are slightly lower for the current week. Globe pearl is quoted at $2.55 per 100 pounds, in bags, and at $2.80 in barrels. Special paper starch is quoted at $2.65 per 100 pounds, in bags, and at $2.90 in barrels; all prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—The prices of sulphate of alumina are firm and unchanged from prevailing quotations. The commercial grades are quoted at from $1.25 to $1.60 per 100 pounds; iron free at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The prices of sulphur continue firm and conform to prevailing quotations. Annual contracts are offered at $18 per long ton, f.o.b., cars at mines. Spot and nearby car lots are quoted at $21 per ton.

TALC—The talc market reports prices as firm and unchanged for the week. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$5.25	@	—
Superstandard	5.00	@	—
Northern Standard Wrapping	4.75	@	—
Standard Wrapping	4.50	@	—
Tissues—Per Ream—Carlots			
White No. 1	1.02½	@	—
White No. 1 M. G.	.97½	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.40	@	—
Bleached Toilet	5.26	@	—
Paper Towels—			
Unbleached	1.95	@	—
Bleached	3.15	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	$8.25	@	$10.25
No. 2 Jute	7.50	@	9.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Boards, per ton—			
News	$32.50	@	$35.00
Chip	32.50	@	—
Sgl. Mla. Ll. Chip.	47.50	@	50.00
Jute Lined Chip	52.50	@	—
White Pat. Coated	62.50	@	—
Kraft Liners	55.00	@	—
Binders Boards	75.00	@	80.00

The following are representative of distributors' resale prices:—

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1.	$41.40@$48.50	$42.55@$50.00
100% Rag	32.80@ 38.50	33.95@ 39.75
85% Rag	.....	32.20@ 37.75
75% Rag	24.75@ 29.00	25.90@ 30.50
65% Rag	21.65@ 26.25	22.80@ 27.75
50% Rag	18.70@ 22.75	19.90@ 24.25
25% Rag	15.80@ 19.25	16.95@ 20.75

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
No. 1.	$9.35@$11.50	$10.55@$12.75
No. 2.	8.50@ 10.25	9.65@ 11.75
No. 4.	7.60@ 9.25	8.80@ 10.75

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated	$12.15	@$14.25
No. 2 Glossy Coated	10.55	@ 12.25
No. 3 Glossy Coated	9.35	@ 11.00
No. 4 Glossy Coated	8.80	@ 10.50
No. 1 Antique (watermarked)	8.80	@ 10.50
No. 2 Offset	8.05	@ 9.50
A Grade E. F.	7.90	@ 9.50
A Grade S. & S. C.	8.15	@ 9.75
B Grade E. F.	7.30	@ 8.75
B Grade S. & S. C.	7.55	@ 9.00
C Grade E. F.	7.00	@ 8.50
C Grade S. & S. C.	7.25	@ 8.75
D Grade E. F.	6.75	@ 8.25
D Grade S. & S. C.	7.00	@ 8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	35.00	@	36.00
Dry	40.00	@	42.00
(Delivered)			
No. 1 Domestic and Canadian	33.00	@	35.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.00	@	4.15
Prime Qualities—			
Easy-Bleaching Sulphite	2.50	@	3.25
Strong Unbleached Sulphite	2.25	@	2.75
(On Dock, Atlantic Ports)			
Kraft Bleached	3.00	@	4.00
Kraft Light & Strong	2.50	@	3.00
Kraft No. 1	2.25	@	2.75
Kraft No. 2	2.00	@	2.25
(F.o.b. Pulp Mill)			
Kraft Domestic	2.00	@	2.50
(Delivered)			
Soda Bleached	2.90	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.25	@	7.75
Silesias No. 1	5.00	@	5.25
New Unbleached	7.75	@	8.25
Blue Overall	5.50	@	6.00
Fancy	3.00	@	3.10
Washables	2.10	@	2.25
Mixed Khaki Cuttings	3.60	@	3.75
O. D. Khaki Cuttings	4.35	@	4.50

Old Rags

White, No. 1—			
Repacked	3.50	@	3.60
Miscellaneous	2.75	@	3.00
White, No. 2—			
Repacked	2.10	@	2.25
Miscellaneous	1.70	@	1.80
Thirds and Blues—			
Repacked	1.40	@	1.50
Miscellaneous	1.25	@	1.30
Roofing Rags—			
No. 1	1.15	@	1.25
No. 2	.95	@	1.00
No. 3 (bagging)	.65	@	.70
No. 4	.65	@	.70
No. 5A	.65	@	.70

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.30
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	5.50

CLEAN CUT

LANGSTON SLITTERS AND ROLL WINDERS

for every job from tissue to heavy board . . . narrow to wide cuts . . . small to large diameters.

SAMUEL M. LANGSTON CO., Camden, N. J.

SHEAR CUT

Since 1901

Dietz Machine Works

DIETZWORKS PHILA PA

MANUFACTURERS

TOILET ROLL CONVERTING MACHINES
TOWEL ROLL CONVERTERS
EMBOSSING EQUIPMENT
ANILINE PRINTERS
TOWEL INTERFOLDING MACHINES
ROTARY CARD CUTTERS
SLITTERS FOR VULCANIZED FIBRE

Sta. "O" 126-128 W. Fontaine St. Phila., Penna.

SONOCO

SPIRAL WOUND RETURNABLE AND NON-RETURNABLE

PAPER MILL CORES

Because of their outstanding quality, long life and dependability, Sonoco Cores are daily gaining new friends throughout the entire Paper Mill Industry.
Write for samples and prices and judge Sonoco Cores for yourself.

SONOCO PRODUCTS COMPANY

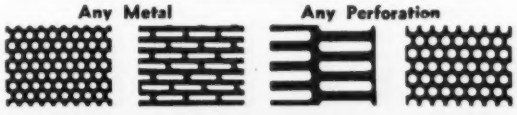
BRANTFORD, ONT. HARTSVILLE, S. C. MYSTIC, CONN.

Pulp and Paper Mill Screens

Of Stainless Steel—Copper—Bronze—Monel—Chemical Resisting Alloys

Perforations that are accurate in size

Any Metal Any Perforation



The Harrington & King Perforating Co.

5652 Fillmore St., Chicago, Ill. 114 Liberty St., New York, N.Y.

CASEIN

Uniform Quality
Dependable Service
Special Types to Meet Unusual Requirements

CASEIN COMPANY OF AMERICA, INC.

350 Madison Avenue, New York, N. Y.

Oldest and Largest Producers of Casein in America

TANKS..

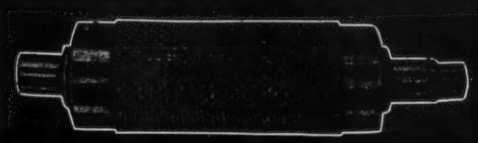
It's Time To Modernize!

Tell us your needs and we'll send complete information and blue prints of Kalamazoo Vitrified Glazed Tile for Jordan Chests, beater storage chests, beater dump chests, Fletcher-Bleachers, and stock chests. Also Wood Tanks, Acid Tanks, and Blow Pits.

KALAMAZOO TANK & SILO COMPANY

KALAMAZOO, MICHIGAN

EMBOSSING ROLLERS



ROEHLEN ENGRAVING WORKS INC.

324 ST. PAUL ST.

ROCHESTER, N. Y.

DIAMOND VULCANIZED FIBRE
DILECTO PHENOL FIBRE
VULCOID MICABOND
DILOPHANE

CONTINENTAL-DIAMOND FIBRE COMPANY

NEWARK, DELAWARE

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons..	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.20	@	2.25
Domestic	2.00	@	2.15
Wool Tares, light....	1.50	@	1.75
Wool Tares, heavy..	2.00	@	2.10
Bright Bagging.....	1.60	@	1.70
Manila Rope—			
Foreign	3.00	@	3.25
Domestic	2.75	@	3.00
Jute Threads.....	2.75	@	3.00
Sisal Strings.....	1.75	@	2.00
Mixed Strings.....	.60	@	.70

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.40	@	2.50
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.80	@	2.20
Flat Stock—			
Stitchless	.70	@	.80
Overissue Mag.....	.60	@	.70
Solid Flat Book...	.50	@	.55
Crumbled No. 1....	.40	@	.45
Ledger Stock.....	.90	@	.95
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut....	1.85	@	2.00
New Cuttings.....	1.50	@	1.60
Old Kraft Machine— Compressed bales..	.70	@	.80
News—			
No. 1 White News	1.10	@	1.20
Strictly Overissue.	.45	@	.50
Strictly Folded....	.30	@	.35
No. 1 Mixed Paper..	.15	@	.20

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.14	@	.16
White Hemp.....	.15½	@	.17
Fine Polished—			
Fine India.....	.18	@	.20
Unpolished—			
Box	.10	@	.10½
Paper Makers.....	.10½	@	.12¼
Tube Rope.....	.10½	@	.13¾
Wall Paper.....	.12½	@	.13¼
Wrapping	.13½	@	.14
Soft Fiber Rope...	.12¼	@	.13½
Cotton	.12¾	@	.13½

(Hard Fiber)

Medium Java.....	.10½	@	.11
Mex. Sisal.....	.10	@	.10½
Manila	.20	@	.27
Domestic	2.25	@	2.50
Sisal Rope.....	1.65	@	1.75
Mixed Rope.....	.50	@	.55
Transmission Rope..	1.00	@	1.25
Soft Jute Ropes.....	1.90	@	2.00
Jute Carpet Threads.	1.00	@	1.50
Gunny Bagging—			
Foreign	2.00	@	2.05
Domestic	1.65	@	1.85
Bleachery Burlap....	3.50	@	4.00
Scrap Burlap—			
Foreign	1.60	@	1.75
Domestic	1.50	@	1.60
Scrap Sisal	1.25	@	1.50
Scrap Sisal for Shredding	1.85	@	2.00
Wool Tares, Heavy.	1.50	@	1.60
New Burlap Cuttings	1.85	@	2.00
Aust. Wool Pouches.	2.75	@	3.00
Heavy baling bagging	1.75	@	1.90
Paper Mill Bagging.	1.50	@	1.60
Bagging No. 2.....	.85	@	1.00

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.03	@	.03¼
New White No.1..	.06¾	@	.07
New White No. 2.	.05	@	.05½
New Light Flannelettes	—	@	.05½
Silesias No. 1.....	.05½	@	.06
New Black Silesias..	.03¾	@	.04
Silesias No. 1			
Soft Unbleached.....	.06¾	@	.07
Blue Cheviots.....	.05½	@	.06
Fancy	.03	@	.03¼
Washable	.02¾	@	.03
Cottons—According to grades—			
Blue overalls.....	.05½	@	.06
New Black, soft...	.03¾	@	.04
Khaki Cuttings.....	.03½	@	.04
O. D. Khaki.....	.04	@	.04½
Corduroy	.02¾	@	.03
New Canvas.....	.07¼	@	.07¾
B.V.D. Cuttings.....	.06¾	@	.07¼

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.75	@	.85
No. 3.....	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	1.25	@	1.30
Dutch Blues.....	2.75	@	2.90
Checks and Blues	2.85	@	3.00
Old Fustians.....	2.50	@	2.60
Old Linsey garments.	1.75	@	1.90
New Silesias.....	6.00	@	6.50

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06½
New White, No. 2.	.04	@	.04½
Light Silesias.....	—	@	.05
Silesias, No. 1....	—	@	.05
Black Silesias, soft.	.03	@	.03½
New Unbleached..	—	@	.06
Washable, No. 1..	.01½	@	.01¾
Blue Overall.....	.04	@	.04½
Cottons According to grades—			
Washable, No. 2..	.01¼	@	.01½
New Blue.....	.01¼	@	.01½
Fancy Percales....	—	@	.03
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.05
New Dark Seconds	.75	@	1.00
Khaki Cuttings—			
No. 1 O. D.....	.03½	@	.04
No. 2 Mixed.....	—	@	.02¾
Corduroy	—	@	.02
New Canvas.....	.05½	@	.06
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.00
Miscellaneous	2.25	@	2.50
Thirds and Blues—			
Miscellaneous	1.25	@	1.50
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1....	—	@	.75
Domestic No. 1...	—	@	.75
Domestic No. 2...	.65	@	.75
Roofing Bagging..	.80	@	.90

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.75	@	—
Domestic	1.70	@	1.75
Manila Rope.....	3.00	@	3.25
Sisal Rope.....	1.75	@	2.00
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	1.50	@	—
No. 2.....	1.00	@	1.25
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.35	@	2.40
No. 2 Hard White.	2.00	@	2.10
No. 1 Soft White..	2.00	@	2.10
No. 2 Soft White..	1.40	@	1.50
No. 1 Mixed.....	.70	@	.75
Solid Ledger Stock..	1.50	@	1.60
Ledger Stock, white.	1.25	@	1.30
Ledger Stock, colored	.85	@	.90
No. 1 Books, heavy..	.85	@	.90
Manila Cuttings.....	1.50	@	1.75
Print Manila.....	.45	@	.50
Container Manila....	—	@	.40
Kraft Paper.....	.90	@	.95
No. 1 Mixed Paper..	.25	@	.30
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.55	@	.60
Old Newspapers	.30	@	.35

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White.	2.25	@	2.40
No. 1 Soft White..	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.65	@	.75
No. 1 Books, light...	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.60	@	1.70
Manila Envelope Cuttings, extra quality	2.00	@	2.10
No. 1 Old Manila....	.85	@	.95
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.90	@	1.00
Mixed Papers	.10	@	.15
Print Manila.....	.45	@	.50
Container Manilas..	27½	@	—
Old Newspapers.....	.30	@	.35
Paper Wool Strings.	—	@	.60
Overissue News.....	.45	@	.50
Box Board Chips....	.20	@	.25
Corrugated Boxes...	.30	@	.35
Kraft corrugated boxes	.60	@	.65
Screenings wrappers.	.45	@	.50

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.25	@	2.50

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	3.15	@	3.25
No. 1 Hard White.	2.50	@	2.60
No. 1 Soft White..	2.05	@	2.10
Ledger & Writings..	1.30	@	1.40
Solid Books.....	1.20	@	1.25
Blanks	1.40	@	1.50
Krafts	.90	@	1.00
New Kraft Cuts.....	1.70	@	1.80
Manila Env. Cuts...	2.15	@	2.25
Ex. No. 1 Manila...	2.15	@	2.25
Out Manila.....	1.70	@	1.80
Overissue News.....	.60	@	.70
Old Newspapers—			
No. 1 Folded News	.45	@	.50
No. 1 Mixed Paper	.35	@	.40
Roofing Stocks—			
No. 1.....	2.00	@	2.10
No. 2.....	1.85	@	2.00

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.35½	@	.36½
No. 1 Tints	.36½	@	.37½
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	—	@	.1[illegible]5
No. 4 Tints	.16	@	.1650
No. 5 Bond—White	11.35	@	
No. 5 Bond—Tints	12.35	@	
No. 5 Bond—Golden Rod	13.35	@	
No. 5 Ledger—White	.1185	@	
No. 5 Ledger—Tints	.1285	@	
No. 6 Bond—White	10.75	@	
No. 6 Bond—Tints	11.25	@	
No. 6 Bond—Golden Rod	12.75	@	
No. 7 Bond—White	9.10	@	
No. 7 Bond—Tints	9.60	@	
No. 7 Bond—Golden Rod	11.10	@	

Book

No. 1 M. F.	7.10	@	7.35
No. 2 M. F.	6.85	@	7.20
No. 3 M. F.	5.60	@	5.20
No. 1 S. C.	7.60	@	7.85
No. 2 S. C.	7.10	@	7.35
No. 3 S. C.	6.10	@	6.3
No. 1 Coated and Litho	12.50	@	
No. 2 Coated and Litho	11.00	@	
No. 3 Coated and Litho	9.50	@	10.00
Coated tinted	13.00	@	13.50

Wrapping —delivered—

Kraft Brown	4.85	@	5.50
White Wrap	4.00	@	—
No. 1 Manila	4.90	@	5.25
No. 1 Manila	5.50	@	7.00
Fiber	5.50	@	
Kraft No. 1	5.50	@	

(F. o. b. Cars, Toronto)

News, per ton—			
Rolls (contract)...	50.00	@	—
Sheets	58.00	@	—

Pulp

Ground wood.....	30.00	@	—
Unbleached Sulphite.	49.00	@	—
Book (Class 1).....	64.00	@	—
Writing (Class 2)...	62.00	@	—
Select (Class 3).....	63.00	@	—

Old Waste Paper

(in carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.50	@	—
Soft White.....	2.15	@	—
White Blk. News..	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.00	@	—
Light and Crumpled Book Stock.	.85	@	—
Ledgers and Writings	1.20	@	—
Manilas—			
New Manila Cut...	1.35	@	—
Printed Manilas...	.55	@	—
Kraft	1.00	@	1.10
News and Scrap—			
Strictly Overissue.	.65	@	—
Strictly Folded....	.60	@	—
No. 1 Mixed Paper..	.50	@	—

Domestic Rags

Price to mills, f. o. b. Toronto

White Shirt Cuttings	.06¼	@	.07
Fancy Shirt Cuttings	.02½	@	.03¼